Science & Zen: A Closer Look

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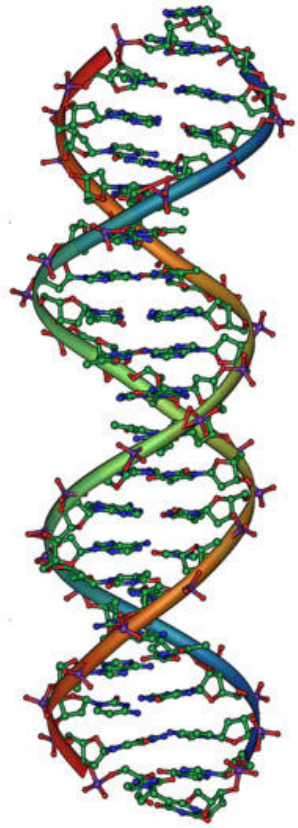


DNA is the instruction manual for all life. Is its existence merely an aspect of reality, or does it embody reality? Are we no more than parts assembled from an instruction manual, or are we an expression of a reality more fundamental and universal – a reality in which DNA is just *one* expression?

Neuroscience has recently revolutionized the way we envision the mind and the brain. With functional Magnetic Resonance Imaging (fMRI) we can now literally see the brain working in real time as different parts of the brain "light up" in response to various internal and external stimuli. Researchers now better understand not only how we think about things, but also how we *feel* about things. Emotions of all kinds -- empathy, happiness, melancholy, anger, frustration, joy – are all seen as unique brain activities in particular parts of the brain. Researchers are also finding that people differ, often quite dramatically, in the degree to which these specific parts of the brain are active for specific emotions. Some people have a huge area of the brain devoted, for example, to anger, while others may have more brain development in the empathy area (empathy, we are told, is a direct result of the presence of motor neurons in the brain). fMRI studies of meditators have also revealed distinctly elevated activity in the parts of the brain responsible for attention and awareness.

A host of questions may arise in light of so much new scientific data as it relates to Zen or, in fact, to any spiritual practice. Is consciousness indeed no more than a collection of firing neurons? Is awareness something that can be assembled with so many dendrites, neurotransmitters, and the like? Is there a *reason* to engage in a difficult spiritual discipline if we are no more than a composite of our constituent parts? Is there nothing beyond that?

Science seems to forever get into conflict with religion. People on one side insist that spirituality and science are incompatible; on the other, they suggest that Satori,

Enlightenment, Samadhi, Divine Union, etc., are all just terms for states of awareness we experience on the spiritual journey; that they simply reflect specific brain states rather than illuminating some fundamental aspect of reality. Is reality just a "state of mind" or does reality exist independently of mind? This question has kept philosophers busy for centuries and likely will continue to for centuries to come.

But let's look at these questions from a mystic's point of view. As a physics graduate student many years ago, I remember working to solve a particular problem in quantum mechanics that had me stymied for weeks. I thought about the problem day and night, spent hours with pencil and paper at a desk every day trying to work out its solution. But the harder I worked on it, the farther I seemed to get from an answer. I became consumed with figuring it out, to the extent that I skipped meals and missed sleep. Then one night, around 3:00 in the morning, I awoke with a start, sat bolt-upright in bed, and realized I had the entire answer to the

Neuroscientist V. S. Ramachandran published a now-popular essay in *Edge* in which he posed the following scenario (perhaps after watching the movie, The Matrix):

"Lets advance to a point of time where we know everything there is to know about the intricate circuitry and functioning of the human brain. With this knowledge, it would be possible for a neuroscientist to isolate your brain in a vat of nutrients and keep it alive and healthy indefinitely.

"Utilizing thousands of electrodes and appropriate patterns of electrical stimulation, the scientist makes your brain think and feel that it's experiencing actual life events. The simulation is perfect and includes a sense of time and planning for the future. The brain doesn't know that its experiences, its entire life, are not real.

"Further assume that the scientist can make your brain "think" and experience being a combination of Einstein, Mark Spitz, Bill Gates, Hugh Heffner, and Gandhi, while at the same time preserving your own deeply personal memories and identity (there's nothing in contemporary brain science that forbids such a scenario). The mad neuroscientist then gives you a choice. You can either be this incredible, deliriously happy being floating forever in the vat or be your real self, more or less like you are now (for the sake of argument we will further assume that you are basically a happy and contended person, not a starving pheasant). Which of the two would you pick?"

In answering his question we should ask ourselves two questions: 1) would we *want* our sensory awareness to be dependent on someone else? 2) if we recognize sensory inputs and a sense of individual self as illusory (i.e., we're enlightened), what would be the lure to the proposed "brain vat?" In fact, isn't the brain already in such a vat of cerebral spinal fluid? And isn't the scientist that's affecting our perceptions Nature itself? The proposed experiment is just a scaled-down version of our existing situation.

problem. Clear as a bell. I went to my desk and began working and within a couple hours had the complete detailed solution to the problem written out.

What was most interesting about this event was how the solution presented itself to me – as a complete whole. No parts at all … just a totality, devoid, even, of mathematics. It was *after* the realization that the mathematical mind went to work and expressed what it was that I already knew non-mathematically. When I explained what happened to my thesis advisor he laughed – one of those genuine bellowing sorts of laughs he had. He was delighted with my little epiphany. He told me this sort of experience was common among physicists and proceeded to remind me of many of the great scientific discoveries that had happened this way – the most famous of all, perhaps, being the mathematician Archimedes, to whom, it's said, we owe the ever-lasting exclamation "Eureka!" [The story goes, that while taking a bath he spontaneously understood the nature of buoyancy and ran through the streets shouting "Eureka!" – a quite meaningless word.] We now also have *Archimedes' Principal,* which, in simple terms, says essentially that an object placed in water displaces an amount of water, in weight, equal to the object's weight. Whether the Eureka story is true or not, it illustrates a very significant aspect of the discovery process and one I came to know first-hand.

Understanding does not happen in a linear, sequential, way – it happens in a holistic way: everything coming together at once. The thinking process actually gets in the way of complete understanding. In a way, we have to "un-think" things to understand them; yet at the same time, we must pursue them with feverish intensity in order for them to reveal themselves to us. My "eureka moment" would have never happened had I not applied unrelenting willpower and questioning to the matter. And this is the key, too, with Zen. Zen is not a passive activity but requires intense, even feverish, effort – effort of caring, effort to find an answer, a solution.

If that effort is focused on the underlying nature of our lives – the purpose of koan and hua tou practices -- we'll get one answer (satori) or if it's focused on a something else, like a physical phenomena – the purpose of science -- we'll get another (like

understanding how boats float). Either way, the discovery process seems to be the same – we come to *understand* in sudden bursts – in a totalistic way. We see the whole *before* we see the parts. Once the whole is seen, the mind goes to work to uncover the pieces that comprise it … but can't we say that those pieces are then manifestations of the mind – of the thinking process itself? To the participant, coming to understand something in this "eureka" way is like receiving a gift from the "great beyond" because there's no sense of us having done anything to get it – it just … happens. We are just a receiver.

In an interview with D.T. Suzuki, Huston Smith once asked him to comment on why he thought westerners were becoming so interested in Zen. Suzuki apparently saw science as alluring to people interested in understanding reality, but as a dead end for those wanting to understand its fundamental nature intuitively, for he replied:

> *"Well, what I suspect is the west has given itself up too much to what we call scientific studies. The scientific studies pursue a definite direction. Whereas the west and eastern way of thinking, just the opposite. … Zen is not to be intellectually or conceptually or logically or dialectically or any other kind of "cally" to grasp [he laughs]."*

Scientific inquiry can be as effective a training tool to prepare us for what we call "Zen Mind" as any other, but it can only take us so far. Just as counting the breath as we sit quietly will only take us to a calm, focused state of mind; focusing on issues of scientific nature will only take us to discoveries of a scientific nature. In either case, we are focusing on an *aspect* of the whole, not the whole. For those with questions about life and death science holds only intellectual answers. Turning to a mystical tradition such as Zen is natural for those seeking non-dependent answers.

Certainly, awareness is dependent on our brain's serving up the right neural-forces that connect us to the world around us, but what differentiates Zen and other mystical trajectories from science is that we become *aware of awareness*. And herein the sciences must remain mute, for science is only aware of itself because of the limiting construct and

self-referential nature of the scientific paradigm and mathematical language it uses. Only awareness itself can become Self-aware. Awareness has no physical properties so cannot be contained, conceptually, through any scientific model. My ability to perceive, in a sudden flash, the answer to a challenging problem in physics was much more significant to me than having actually been able to write down the answer (in fact, I no longer remember the physics problem, but vividly remember that eureka moment of discovery).

It's easy to forget about the role of consciousness, especially in science. Yet quantum mechanics, that branch of physics responsible for bringing us the TV and iPod, insists on the dependence of the conscious observer: the act of observing something effects what we observe. Simply put, our own awareness alters the world around us. There is no such thing as a passive observer.

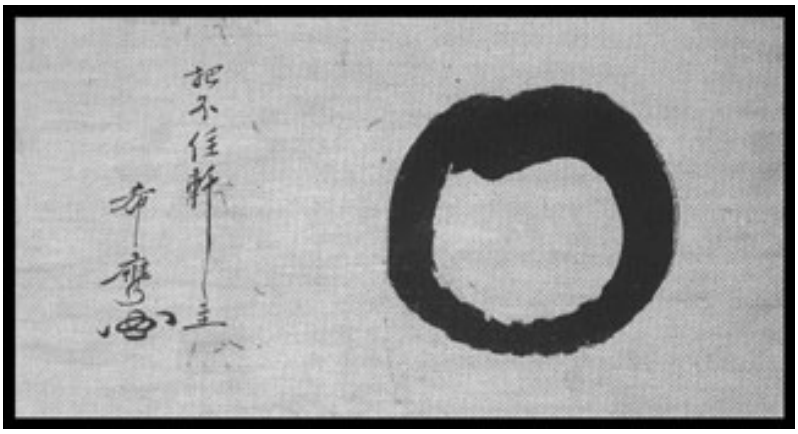
Fundamentally, modern physics and Zen are in perfect harmony. Both see reality as a realm of fluctuating, pulsing, energy, each "bit" overlapping with every other "bit." In physics this is described by what we call the Wave Function - everything has an associated wave function which describes its probabilistic nature in time and space. As a wave, it's spread out over all of space. In Buddhism we call this "sea of suchness" the Dharmakaya. Both Zen and science also recognize that the observer and observed are not separate, but fully intertwined with one-another: put another way, their wave functions overlap.

There are people who differentiate between meditation and Zen meditation; however, meditation is meditation regardless of the mystical tradition it's associated with. The distinction should be between Zen and Meditation, for many people incorrectly equate the two. Zen is the mystical tradition of Buddhism originating from Indian Buddhism and Chinese Taoism. In Japan, the additional influences of the Shinto religion created a distinct form of Zen from Chinese Zen. Regardless, in all countries that adapted a form of Zen from its original Chinese and Indian founders, the essential common characteristic of them all is the same: they all require of the practitioner *fierce investigation into the nature of being*. Zen, as passive sitting to attain a state of peace and tranquility, is a contemporary misunderstanding of Zen/Chan. Scientific investigators must understand too that changes in brain states that lead to increased awareness, relaxation, lower blood pressure, etc., while all well and good, and may inspire the Zen practitioner to meditate in the first place, are *not* what Zen is about. Zen is about recognizing our essential nature as sentient beings – the ultimate understanding of life and death. We consider this to be a far greater goal than being relaxed, or lowering our blood pressure – as lofty as those goals may indeed be!

But while the Zen mind recognizes the universe as a unity, science is still striving to prove that such a condition exists – the quest for the "unifying theory of everything", or *unified field theory*, is one that has been going on for decades. It's no wonder to a Zen person that physicists feel so strongly that such a unitary condition of the universe must exist, for to us it's obvious. This sense of unity … Buddha Mind … pulls us all into it as long as we're receptive to it. I sometimes ask myself, what might be the expression in mathematics for the condition of unity of the universe -- that expression that would tie together all the forces, fields and theories? The only answer that makes sense to me is "0" - zero. Zero both *is* and *is not*. It is a whole, yet contained within it is emptiness. It expresses the essential emptiness (not to be confused with non-existence) of all things. To be empty in this sense is to be fundamentally devoid of attributes, for attributes are merely manifestations of mentation. If some brilliant meta-physicist came along and discovered the "Grand Unified Theory Of Everything" in the form of an equation, that equation might reduce, in its simplest form, to 1=0: "1" is unity, "0" is emptiness. Being equal, they are one and the same. Unfortunately, mathematics does not allow such a condition to exist (!).

The physics community is lately abuzz with a new physics theory, the author calls "*An Exceptionally Simple Theory of Everything*" -- it's based on the geometry of a Mandela-like 248-dimensional figure it's creator, Garrett Lisi, calls "E_8." Just as eager for a "unified theory of everything," Einstein worked on the problem up to the day he died.

The physical cannot be fully understood without the spiritual. Only consciousness itself can become aware of universal unity – the Law, or Dharma, of the universe. With no reliance on science, there is just the inquiring, reflexive mind.



Enso, by Ungo (1582-1659), a famous Renzai (Lin Jy) monk of Japan's Edo period. The Enso, or empty circle, has long been an image of Zen, expressing totality, unity, and emptiness.

Science – as defined by the scientific method itself – is careful to concern itself with only one way of viewing reality. It shows us only one piece of reality – a piece of the whole, the surface appearance -- without showing us what's inside. Finding out what's inside is the goal of any spiritual pursuit, not the least, Zen.

When we do find what's inside, it can be a jolting experience. The entire fabric of our lives is ripped apart, as much because of our surprise at what we find, as because of our surprise that the way we used to see reality was so tremendously wrong and that the way it actually *is* was so completely unimaginable. The experience brings with it the direct realization of unity, non-differentiation and harmony, accompanied with a joy and peace that can only be known once the separation between self and other has vanished.

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Are science and Zen incompatible? Not at all. Each simply leads the investigator to a different area of understanding. Is awareness simply the result of our neurons firing away? Sure, but that's not the point. The mystic will say that the *perception of awareness* is of a universal nature, not confined to any piece of the whole (reality) but *of the whole* … of the universe itself. The ultimate joy of life, of being aware, is the awareness of connectedness, non-duality, and wholeness. Is there a reason to engage in a difficult spiritual regimen if we are just pieces of a whole? We aren't pieces of a whole – that's just a mind-trick. Spiritual regimens just lift the curtain for us so we can see how the trick was done.

Learning about our fundamental nature in the grand scheme enriches our lives and connects us to ourselves. Through that connection we find great joy (and relief!) at not being isolated pieces adrift in an overwhelming mélange of other pieces. Any feelings of loneliness, isolation, or depression disappear because they are all grounded in a mentally created (hence artificial) impression of separation. Science is like the finger pointing to the moon. Our own consciousness is the medium that takes us there.