



karma is chemistry

finding bliss through community and chant

by dearbhla kelly

SATURDAY, 11:45 P.M., THE POD NIGHTCLUB, DUBLIN. It's been twenty-five minutes since my boyfriend and I dropped E and washed it down with Bacardi and Coke before switching to water (alcohol dilutes E's clean high). We're waiting to "come up," we're waiting for the high to kick in. We smile and nod to the familiar faces filling the club. Later on, when we're all high and open, we'll hug and hold hands as we dance to uplifting house music. But now I'm still vaguely anxious and somewhat tense since waiting to come up is always a bit fraught. We dance but can't completely relax into the groove, so we

stand off to the side, sip some water and tap our feet. Then the scag hits, the gnarly bit: vague nausea, dry mouth, shaky lower jaw. From here it's only a few minutes until the high kicks in, and I'm up.

My heart is expanding, my head is clear; I am liquid gold. I must dance. The music is pulsing in my veins, taking over. I am an atom in the music, and my very being is merging with the rhythm. Every part of me is pulsating with the music; it's inside me, causing me to expand. I am riding a wave of love and bliss. I am connected to everyone around me. There's only here, only now. I AM LOVE.

The next day never felt that good, but the lingering hint of a residual high made it bearable. As two, then three days passed, the come-down blues kicked in as the chemicals continued to wear off. I felt lucky I didn't succumb to the severe "Tuesday downer" that leveled a lot of people I knew. For me, going clubbing and taking E was a way of joyfully tapping into a very real sense of community. It was beautiful, the closest thing I'd known in my life to being part of a congregation. But the comedown was a bummer, and I was concerned for my brain cells. Ultimately, I became more interested in intellectual pursuits than chasing a chemically-induced high and left the party circuit to pursue graduate studies in philosophy.

Although I don't advocate the use of E, I can't honestly say that I regret having used it. Under its influence I experienced something previously unavailable to me: the sense of profound connection to others, the feeling that my heart was exploding with love, the music pulsing in my veins. It was undoubtedly spiritual, and I transcended the limits of my own hang-ups and self-consciousness to feel a part of something much bigger than me.

It was several years until I experienced my next hit of that same overflowing joy and sense of deep connection to the music and everyone around me. The next experience had no E. I was at a *kirtan* at Moksha Yoga Center in Chicago marking the first anniversary of the 9/11 attacks where I was blown away by the chant. I felt like my heart had been blasted open, and I experienced a profound sense of connection to everyone in the room. Later that night, I lay awake unable to sleep (another side effect of Ecstasy) and I knew without a doubt that my spirit had come home.

At another Moksha *kirtan* I had the visceral realization that chanting Sanskrit *mantra* to the divine took me to the same place of open-heartedness and connection with something much bigger than myself that Ecstasy had taken me so many years before in clubs in Dublin and London. I was once again exploding with love, but this time I was chanting to God in a Yoga studio.

I shouldn't have been so surprised by the commonalities among my experiences of bliss. On the surface, they had seemingly different causes, but beneath the skin, at the molecular level, all our emotional and physiological states can be explained in terms of different biochemical combinations. Taking drugs alters our biochemistry, and therefore our feelings. My ecstatic state was just as drug-induced when I was chanting *mantra* as when I actually took E, but when chanting, the drugs were my body's own. Of course I didn't know this at that time; most of us don't tend to understand our experience of the ineffable through the lens of science, especially when we're dancing the high. When I journeyed deeper into studies of Yoga and philosophy, I began to fully appreciate the sophisticated connections between body, mind and emotions.

As a philosopher by training (at the time of my Moksha bliss-out I was a PhD candidate), I am perennially linking conceptual threads and searching for the connections between seemingly disparate views. To my frustration, however, as a graduate student and full-time philosopher I was unable to reconcile my intellectual commitments with my increasingly robust spiritual life. So, after devoting almost half of

my life to the pursuit of knowledge in the domain of analytic philosophy, I acquiesced to my heart and chose to follow the path of spirit and focus on experiencing God, rather than finding ultimate explanations.

Just as a sunset is no less beautiful when we understand the Earth's rotation on its axis, our experiences of bliss and transcendence are no less extraordinary because they can be explained in terms of biochemistry.

It was only when I left academic philosophy that I fully began to appreciate its creativity. Analytic philosophy was perhaps the main theatre in which I tried to come to grips with my own need to impose meaning on a random sequence of events and causes. Just as the sculptor imposes her creative vision on the surrounding world by giving form to matter, the philosopher imposes meaning through the articulation of concepts. The creative act is at its source spiritually, and spirit doesn't care how it manifests, but manifests it will. The domains of the heart and the head, and science and spirituality are not necessarily opposed; our limited understanding and way of carving up the world of our experience makes it so.

Spirit in Manifestation: God is in the Molecules

In scientist Candace Pert's book *Molecules of Emotion*, (on which the cult movie *What the Bleep Do We Know?* was based), she claims that God is a neuropeptide. By most people's lights, this could be controversial. But Pert is not making this statement in jest; she credits her scientific research as leading her to a spiritual path. As a graduate student in neuropharmacology, Pert discovered the endorphin receptor in the brain. This led her to assert that we are hard-wired for bliss; the experience of bliss is part of our physiology. The mind translates biochemical changes into emotions. Endorphins and other neuropeptides make us feel good; therefore our own biochemistry is the key to our ongoing happiness.

Peptides are protein molecules that use chemical signals to convey information throughout the body. These come in two types: receptors and ligands. Receptors are binding sites, often on the surface of our cells. Ligands travel throughout the body to bind with receptors to form a new information packet with a new chemical formula. The subsequent reaction and interaction allow us to experience the change in biochemistry on the cellular level as a change in how we feel emotionally. Peptides are the body's own drugs, when these drugs are produced within the body, we call them endogenous. Categorized by type, neuropeptides live in the brain and central nervous system, other peptides are the messengers in systems such as the endocrine (many hormones are peptides) and immune.

Oxytocin is one of the endogenous peptides stimulated by taking E. It's also released during sex and helps pair-bonding and stimulates feelings of trust, as countless lovers can testify. Oxytocin is also released during childbirth and when nipples are stimulated, so it's implicated in maternal behavior and it increases empathy and feelings of love and connection to others (which is why being on Ecstasy feels so good).

Endorphins represent a category of peptides; they are the body's natural opiates modulating pain and producing feelings of well-being. Acupuncture and massage can alleviate pain by stimulating the release of endorphins into cerebrospinal fluid. Exercise and movement including running and Hatha Yoga stimulate endorphin production and the resultant feelings of wellness. *Pranayama* (yogic breath techniques) and deep breathing have the same effect; a fact well-known by practitioners

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of Yoga and meditation and doctors, nurses and midwives.

Peptides mediate communication and one of the areas of the brain involved in pain perception and management is the periaqueductal gray (PAG), part of the midbrain. Stimulating the PAG causes the release of serotonin and enkephalins (another type of endogenous opioid, feel-good chemical and pain reliever, like the endorphins). Advanced breathing techniques used by women in childbirth and in Yoga and by meditation practitioners influences the PAG and resets pain thresholds. Changing the rate and depth of the breath influences the release of peptides. Breathing rapidly and retaining the breath accelerate peptide diffusion throughout the cerebrospinal fluid, accelerating their pain-relieving effects.

Our connection to our bodies and our intuitive understanding of the intimate connections between body and emotions gives us a deeper understanding of the power of the breath. Many years ago, when my mother was dying of cancer, I stayed up with her until the early hours going over her medication regimen, trying to calm her down and put her mind at ease. Nothing worked. Eventually it dawned on me that if I could just get her to focus on her breath, her anxiety would lessen. And it did. In the long, black nights following her death, breathing meditations helped me fall asleep. It was the only thing that helped me stay in the moment and find some modicum of peace.

It's no wonder that chanting results in such heightened feelings of well-being: when we sing our practice of *pranayama* and connection to the breath stimulates the release of endorphins and other peptides. Combine this with chanting with a large group of people and it seems to lead us to a place of deeper connection to the mystery, a more profound sense of merging with the collective.

The bliss breakdown looks something like this: chanting, via *pranayama*, causes the body to make and metabolize its own (endogenous) drugs which produce heightened feelings of well-being; taking Ecstasy (an exogenous drug that stimulates our endogenous neuropeptides serotonin, oxytocin and dopamine) gets us to a similar place experientially, although the health benefits of chanting clearly outweigh those of taking Ecstasy. The point is that the mind is fooled and doesn't necessarily discriminate between endogenous and exogenous drugs. Similar changes in our emotional landscape result from both scenarios.

The discovery of peptides, and the ligand-receptor relationship, has expanded our understanding of the mind-body connection. Explaining our emotional lives in terms of changes in biochemistry does not have to diminish our wonder and awe at the range and vibrancy of shades in the emotional spectrum. Just as a sunset is no less beautiful when we understand the Earth's rotation on its axis, our experi-



Photo: Adam Latham, angeladam.com

ences of bliss and transcendence are no less extraordinary because they can be explained in terms of biochemistry. This understanding helps us to appreciate even more the sophistication of the ancient yogis who developed and refined breathing techniques and *asana* (posture) designed to yield beneficial results even without the advantage of microscopes and discovering receptors.

Pert's work, and that of other scientists, has deepened our understanding of how body, mind and emotions operate as an integrated system. In most circumstances, our minds and bodies are immediately available to us as objects of our experience; our emotions are the way we experience peptides. The system functions optimally when peptides are flowing freely and migrating from one area of the body to another to find their mating partner. When the connection occurs, the diffusion of information throughout the body is expedited, and the endocrine, immune and nervous systems can talk to each other.

Karma Becomes Chemistry

Just as people routinely become addicted to drugs like heroin, we can and do become addicted to the body's own drugs. In some circumstances our endogenous peptides can be harmful. For example, the interconnected communication system of the Hypothalamic-Pituitary-Adrenal Axis (HPA Axis) modulates our stress response through a complex system of hormones and peptides that send messages between the hypothalamus, the pituitary and the adrenals, and from there, throughout the rest of the body. Our stress response can be mediated and mitigated by our life experience. Sometimes this is positive, at other times less so. Corticotropin-releasing factor (CRF) is a peptide secreted by the hypothalamus in this cascade response that communicates with the pituitary, which in turn, releases hormones to signal the adrenals to produce and release stress hormones. Scientists speculate that CRF production is increased by negative childhood experiences, which get stored in the body as somatic memory. Subsequent negative expectations can stimulate CRF production and chemical cravings for CRF, and so a vicious cycle begins. As CRF levels in the blood increase, CRF receptors become desensitized, shrink, and decrease in number. So the body's inbuilt response system malfunctions and fails to signify that there are already enough steroids in the blood, and increasing numbers are pumped out, chronically elevating stress levels.

Our addictions elicit specific behavior and in the case of endogenous drugs, (those produced by the body), we are often unaware of the addiction. But as in the previous example, many habitual reactions and thought patterns can be explained in terms of those addictions, much like the role of *samskara* and *karma* (the law of cause

and effect, action or reaction) in the yogic view. Our *samskara* are the latent mental impressions, which, when activated, can cause a habitual mode of thought and/or behavior. They are tendencies toward a specific way of thinking or behaving, a mental groove or neural pathway. The habitual receptor-ligand connection and sensitivities are a biochemical manifestation of this. The old adage that we don't engage in any behaviors without a payoff can be parsed in terms of an unconscious craving for certain chemicals: *karma* becomes chemistry.

Our body's storehouse of memories frequently directs our behavior. These memories are stored in the brain and beyond, in a psychosomatic network that extends throughout the body, including the HPA axis and the receptor-ligand complexes throughout our system. We experience this on a visceral level. Imagine for a moment that you are biting into a wedge of lemon and feel the effect on your tongue. Next, think of a situation in which you were very happy and note your body's response, then recall a situation where you were anxious or fearful and feel your body's contraction.

Neurobiologists describe memory as a stored pattern of links between nerve cells. A memory is created when synapses in a network of neurons are activated for a short time. The more often the memory is recalled afterwards, the more likely it is that permanent links develop between nerve cells. Every time the memory is recalled, a specific neuropeptide is activated along with the emotional tone that accompanies the memory. The activation of the neuropeptide causes a biochemical change on the physical level, which the mind translates as an emotion.

Alarm bells may be furiously ringing in some of your heads at the moment: Wait! mystical states are paradigm instances of transcending the merely physical. The ecstatic writings of such mystics as Teresa of Avila, Rumi and Kabir represent the very apotheosis of spirituality. How can such states possibly be explained in something as crude as the language of biochemistry? But there's a poetry and elegance to the scientific description that does justice to our sense of

the mystical as sacred.

The process by which receptors and ligands find each and join together is akin to a mating ritual, a dance where both parties move towards each other. Using a process called chemotaxis, they pick up on each other's scent and then travel toward each other, vibrating as they move. When ligand and receptor unite the action of the ligand binding with the receptor, it causes it to dance and sway. The imagery is redolent of the dance of Shiva and Shakti, male and female, yin and yang, the age-old movement from separation to closeness, division to unity.

Altered emotional states are a common feature of spiritual experiences, as countless mystics can testify, among them Timothy Leary, Ram Das and other champions of the mind-altering drug LSD in the late 1960s. In such altered states the limitations of our conventional way of being are overcome and awareness expands beyond the realm of the normal. The mundanity of life is superseded by the immediacy of pure presence and the concerns of self dissolve in the experience of Self; the particular is enveloped in the universal: *Sat Chit Ananda*. (Sat Chit Ananda is experience of transcending our limited sense of ourselves as atomic beings. It is a deep intimacy with the eternal self, the Godhead.) This is exactly what I experienced as a clubber in the mid-1990s in Dublin, but I didn't have the language to articulate my experience.

Imagine my relief and joy when I encountered Yoga. Here was a system that not only allowed me to contextualize my experiences of altered states, but allowed me to see them as pathways to the divine, a relationship with a God whom I intuitively related to. Coming to understand that *karma* can be explained in terms of biochemistry has enhanced my understanding of *samskara* and helped me to see that, although love can be understood as a function of physiological states, the feelings it produces are no less magical, its effects no less real.

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Dearbhla Kelly is a Los Angeles-based Yoga teacher, writer and philosopher. Find more information about Dearbhla and her work at: durgayoga.com.

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Photo of Rising Lotus Yoga: Adam Latham, angeladam.com