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Black swans and quotation marks: Is "energy" real?

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> *No amount of observations of white swans can allow the inference that all swans are white, but the observation of a single black swan is sufficient to refute that conclusion.*
> - John Stuart Mill, British philosopher (1843)

Abstract

Paradigm shifts often require a "black swan" event in order to reach a tipping point. This article describes several ways in which the materialist paradigm of medicine has been approaching such an inflection point, one that would require acceptance of the existence of such intangible factors as "energy" and consciousness. Interventions like yoga, meditation and acupuncture derive from vitalist traditions, but many, if not most, of their clinical effects can be explained without invoking those factors. However, the phenomenon of post-amputation phantom limbs is not readily reducible to the materialist, brain-based paradigm of neuroscience. Several aspects of phantoms are discussed, as well as the related phenomenon of the phantom leaf effect, wherein an electromagnetic field surrounding the cut-off tip of a leaf has been imaged via Kirlian photography. Its relevance to human phantom limbs, and to an energy-based model of human beings, is discussed, and directions for future research are suggested.

Key words: paradigm shift, subtle energy, phantom limb

The Roman poet Juvenal coined the term "rara avis" (rare bird) to describe an impossibly unlikely occurrence, and used the example of imaginary black swans to illustrate his point. The discovery of actual black swans in Australia by Dutch explorers 1400 years later upended the belief that all swans are white, and led to Mill's comment on the nature of falsification in science. Since then, discoveries that upset established modes of thinking have come to be termed "black swan events." Integrative medicine has its fair share of black swans, and one of my favorites is the subject of this discussion.

It's ironic that so many of the holistic modalities that are now gaining mainstream acceptance, such as yoga, acupuncture, meditation, tai chi and others, originated in healing traditions that embrace the decidedly non-Western concept of an invisible and universal life energy, a vital force whose even flow maintains balance and health in the organism. In contrast, modern biomedicine has adopted a mechanistic view – the body is seen as a very complex machine whose functioning can best be

understood by learning what each of its component parts is doing. Repairing the malfunctioning parts restores health.

But breaking complex processes down into component parts is a two-edged sword. Can we ever put Humpty Dumpty back together again, or are we trying to re-animate a corpse by using reductionism to understand how the living human body functions? For example, a popular YouTube video shows a huge flock of starlings flying in choreographed synchrony (Flight of the Starlings, Web ref.). Much like a school of fish, these birds appear to the naked eye to be functioning as one unified super-organism, a living embodiment of Sheldrake's morphic fields, the intangible organizing influences that coordinate group behaviors (Sheldrake, 2009). But according to the reductionist view, fueled by digital computer analysis, the birds are each processing visual signals from adjacent birds and simply follow the leader (Attanasi, Cavagna et al, 2015). No mystery or awe, just a complex set of data points.

This reductionist viewpoint may be evolving, however, thanks to recent advances that may help bridge the gap between the vitalist and the mechanistic paradigms.These advances are increasingly being reported in respected medical journals like the Journal of Alternative and Complementary Medicine (JACM), which publish modern assessments of ancient techniques, and provide a scientific understanding of their modes of action without needing to invoke mystical intangibles. Some examples:

• Acupuncture – Acupuncture points have been re-conceptualized as areas of increased electrical conductivity (Becker, 1990), while the meridian pathways have been shown to correspond to fascial connective tissue planes (Langevin and Yandow, 2002). Furthermore, the piezoelectric properties of collagen enable it to generate microcurrents of electricity when mechanically stimulated by needling or massage (Oschman, 2000). In other words, as current research suggests (Langevin and Wayne, 2018), qi may be reducible to tangible processes like electron flow and intracellular physiology.

• Yoga – The Ayurvedic system of medicine is based on a model which sees the human organism as a series of layered sheaths of progressively more subtle energy. The densest level is the physical body, while the next layer is composed of the subtle energy called "prana". Then follow the progressively more subtle layers of mind, emotion, and finally spirit (Ballentine, Ajaya, 1976). Yoga's postures and breath training are designed to stimulate the flow of this life energy. But we may have learned enough about musculoskeletal flexibility, the fascial matrix, and proprioceptive feedback mechanisms to account for yoga's clinical benefits without needing to invoke prana.

• Meditation – Modern neuroscience explains the benefits of meditation by reference to enhanced neural plasticity, cortical thickening, and improved autonomic regulation (Lazar, Kerr, Wasserman et al, 2005). As brain networks become more interconnected, cognitive processing is optimized. Cognitive neuroscientists see mindful awareness as the outcome of enhancements in coordinated neural networks: mirror neurons mediate empathy, anxiety cells create the sensation of anxiety (Jiminez, Su et al, 2018), and so on. In other words, the physical brain generates the intangible mind.

• Energy fields – The human biofield is now an accepted and widely studied phenomenon (Rubik, 2002; Jain, Ives, Jonas, et al, 2015). The discipline of bioelectromagnetism has shown that electromagnetic fields (EMFs) surrounding the body can account for such interactive phenomena as emotional resonance (Leskowitz, 2008) and heart/brain coherence (McCraty, Atkinson, Tomasino et al, 2009). The metaphysical concept of the "aura" might be unnecessary if it can be reduced to EMFs.

So, given these recent conceptual advances that seem able to explain the mind, the aura, acupoints and the like, why bother invoking intangibles like energy or consciousness? Won't we eventually be able to understand consciousness and our vivid subjective sense of self-awareness as the inevitable

outcome of complex neuronal interactions? Nobel Prize-winning physicist Max Planck didn't think so (Planck, 1931):

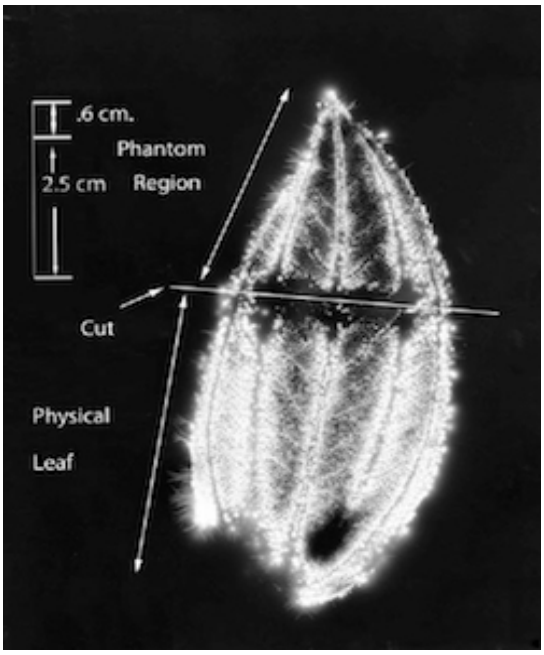
> "I regard consciousness as fundamental. I regard matter as derivative from consciousness. We cannot get behind consciousness. Everything that we talk about, everything that we regard as existing, postulates consciousness."

Similarly, physicist Nassim Haramein offers a telling analogy (Haramein, Web ref.): "Looking for consciousness in the brain is like looking in the radio for the announcer." Let's look at the theories explaining mind, then, as we would at a black swan, to see whether recent conceptual advances have sufficient explanatory power, or whether we really need a new paradigm.

People who suffer limb amputations from accidents or surgery commonly feel as though their missing limb is still present, a sensation sometimes accompanied by an extreme discomfort called phantom limb pain (PLP). The neurologic explanation for this sensation posits a post-injury re-patterning of the cortical matrix: phantom sensations are a subjective sensory construction rather than a valid experience reflecting objective reality (Flor, Nikolajsen, Staehelin, 2006). In contrast, practitioners of biofield therapies often experience anomalous sensory perceptions that are hard to reconcile with this brain-based model. For example, some therapists can detect phantom limbs in the space surrounding the amputation stump. They sense the missing limbs with their hands (Eden and Feinstein, 1998; Leskowitz, 2000). Some amputees can sense when their phantom limb is being "touched" by a practitioner (Leskowitz, 2014), and some can accurately identify objects that are placed "inside" their phantom hand (Derren with amputee, Web ref.). In similar ways, amputees can feel an activation of their own acupuncture meridians - in their phantom limbs - during treatment of the still-present portions of] their limb (Xue, 1986). Each of these unusual examples is consistent with the idea that the phantom is an objectively real and biologically active field, though the points of origin of sensations attributed to stimulation of the missing limb are not evident.

Fortunately, an analogous phenomenon is now being researched with electronic instrumentation. The technique of Kirlian photography can generate and record, a corona discharge pattern around the perimeter of an electrically stimulated leaf. Surprisingly, when the tip of the leaf is cut off, the corona pattern persists along the entire perimeter of the leaf, even around the missing tip (Hubacher, 2015). It even reveals detailed internal structures within the no-longer-present leaf (veins, mid-rib, etc.). This so-called phantom leaf effect strongly parallels the biofield-based energy/trauma model of phantom limb pain (Ballentine, 1976), which proposes that the phantom limb is an invisible but biologically potent energy template that exists despite limb amputation and which can be perceived by the patient. The goal of current research on Kirlian photography and PLP is to directly visualize the phantom limb, to show that it is an intact biofield, a coherent field of objectively verifiable energy which exists independently of the body and which is not an artifact or a by-product of the nearby flesh and blood.

Figure 1. Phantom leaf



Heuristically, we remember how iron filings align themselves with the invisible lines of force in an underlying magnetic field. Amputation may remove the "iron filings" (i.e., the body's cells) while leaving intact the substratum of the subtle energy field. But since the Kirlian EMF surrounding a phantom leaf

tip can exist as an independent replica of the leaf's now-absent material substance, it cannot be generated by the physical matter of the leaf. It is not an artifact or byproduct of cellular function, as the reductionist view would assume. So where did it come from? Might this instead be yoga's pranic sheath, or the mystics' "etheric body" (Ballentine, 1976), the intangible template from which the physical body supposedly springs? If so, this would suggest that the leaf, and perhaps the human body as well, grows in alignment with a pre-existing energetic blueprint, a matrix which seems to be interlinked with the material realm but is not generated by that realm.

And just as an electromagnet may be unable to hold its iron filings in their properly patterned alignment when the current generating the electromagnetic field is reduced or absent, so may an unbalanced and weak biofield be unable to support cellular health and optimal physiologic functioning. Hence, energy medicine interventions that focus on biofield enhancement – such as acupuncture, qi gong, Therapeutic Touch, etc. – may someday come to be viewed as keys to health promotion, disease treatment, and even disease prevention. In other words, we see evidence suggesting that healthy biofields may generate and support healthy cells.

If this is true, then the yogic model of a series of interacting but distinct energy bodies may have validity. The mind may turn out to be the ultimate facilitator, or inhibitor, of energy flow, : "Energy flows where attention goes," thereby fleshing out – literally – the energy template. EMFs may represent the densest and most easily detectable component of this energy body. EMFs may not be synonymous with subtle energy, but may lie midway between physiology and prana. They are an important intermediary concept that bridges the paradigms of mechanism and vitalism by linking physiology to the intangible dimension of energy. Ongoing research may tease out these distinctions and prove that Planck and the vitalists were correct: consciousness is the matrix from which matter springs. If so, it would finally be time to drop the quotation marks and view subtle energy as a truly independent force of Nature.

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