

PHANTOM LIMB PAIN: SUBTLE ENERGY PERSPECTIVES

by Eric Leskowitz, M.D.

ABSTRACT

Phantom limb pain is a puzzling and debilitating condition which responds poorly to allopathic medical interventions. A reconceptualization of this disorder is proposed that integrates notions of subtle energy into an expanded multidimensional paradigm incorporating body, mind and spirit. The biomedical model of pain, perception and memory is reviewed, and found to be unable to explain various aspects of the phantom phenomenon, while the multidimensional energy approach offers explanatory power and opens the door to new therapeutic strategies. An overview of subtle energy anatomy follows, with reference to the use of Kirlian photography to detect possible electromagnetic correlates of life energy. The phenomenon of “phantom leaf” Kirlian photos is compared to phantom limb sensations in humans. Three case vignettes are presented, in which a modification of Therapeutic Touch successfully alters patient perception of phantom pain. Most strikingly, these patients are able to perceive non-contact energy interventions on their phantom limb, despite the absence of relevant portions of their nervous system. The theory of a non-neurologically based memory matrix, in accordance with holographic and non-local principles of consciousness, is outlined. Several possible mechanisms of action are proposed that can serve as the foundation for a pathophysiology of subtle energy disorders. Several research projects are suggested which can further test this model.

KEYWORDS: Phantom pain, subtle energy, Therapeutic Touch

INTRODUCTION

Phantom pain may be one of the most unusual symptoms encountered in rehabilitation medicine. First described by the French military surgeon Ambrose Paré in the 16th century, these painful burning or cramping sensations that seem to come from the missing limb itself affect upwards of 80% of the estimated 1 million people who annually suffer loss of limb through injury or surgery.¹ Similar pain has also been reported in phantom breasts, teeth, penis, eyes and tongue post-operatively.^{1,2} This phantom pain differs from almost universal proprioceptive phantom sensations, in which patients perceive the existence in space of their missing body parts in a normal and not unpleasant manner.³ Phantom pain is frequently quite intense; secondary depression and suicide are not unusual sequelae, testimony to the extreme suffering which accompanies phantom pain. Because of its neuropathic nature, it is not modulated by opiate receptor mechanisms, and so is typically not responsive to standard narcotic medications. Treatment strategies have generally been empiric, ranging from pharmacologic (anticonvulsant) and surgical (destruction of anterior horn cells), to electrical (implanted spinal cord stimulators) and psychological (hypnosis).

Unfortunately, these conventional (and mind/body) treatments for phantom pain are largely palliative at best, and ineffective more often than not. By one estimate, only 7% of phantom pain patients receive any significant long term benefit from the nearly 50 treatment modalities currently used.⁴ It would thus seem that the biomedical model on which the therapies for this disorder are based must also be inadequate. This shortcoming leads us to consider other conceptual models to understand the phantom phenomenon. In this paper, I will describe a novel conceptualization of this disorder that is based on the so-called subtle energy model of human anatomy, a model that underlies many of the world's spiritual and indigenous healing traditions. After outlining this multi-dimensional energy model, I will then describe a therapeutic intervention derived from this model that appears to be clinically effective, as illustrated by several case studies. Informed speculations about possible mechanisms of action will be presented, guided by several heuristic metaphors. Suggestions for future research and implications for the field of complementary and alternative medicine will be discussed.

CURRENT MEDICAL UNDERSTANDING OF PHANTOM PAIN

Allopathic medicine's mechanistic and neurologically based theory of pain and perception has struggled to develop an etiologic theory to explain a sensation that can apparently be generated by absent anatomical structures, and that can even be experienced by paraplegics whose spinal cord has been completely transected rostral to the phantom pain.⁵ Proposed mechanisms focus on various levels of the nervous system at which aberrant functioning is presumed to occur. Peripheralists believe the pain originates in persistent sensations generated by the nerve endings of the stump. Centralists look to the CNS for the source of the abnormal firing patterns, whether at the level of the spinal cord, limbic system or cortical "reverberatory" circuits. Psychologic and mind/body theories assume that cortical modulation of both central and peripheral processes can modulate the pain experience. Generally, several levels of the nervous system are seen to interact in each mechanism. Several examples from the allopathic paradigm follow.

PERIPHERAL

Overactivity of the excitatory neurotransmitter NMDA (N-methyl D-aspartate) has been hypothesized to generate persistent afferent input from damaged stump neurons, which thereby maintains persistent stump and phantom limb pain even in the absence of CNS lesions. NMDA receptor antagonists such as ketamine have been reported to be moderately effective in ameliorating phantom pain in double blind controlled studies.⁶ NMDA-sensitive wide dynamic range neurons also operate in the dorsal horn of the spinal cord, and so ketamine may also have a spinal locus of action. Indirect evidence for this peripheral mechanism comes from an unusual iatrogenic form of phantom pain, in which temporary phantom leg pain has been generated *de novo* in previously pain-free lepers while they were undergoing unrelated spinal anesthesia.⁷ Presumably, the original peripheral nerve damage from leprosy initiated abnormal activity in the dorsal horn of the spinal cord, activity that has been ongoing but has normally been blocked by descending inhibitory control (remembering the gate control theory of pain, wherein central efferent inhibition can block the transmission of afferent impulses to the brain).

When spinal anesthesia blocks this inhibition, then these peripheral pain sensations can reach conscious awareness through the open “gate.”

SPINAL

Anticonvulsants such as clonazepam have been somewhat successful. Their modulation of inhibitory GABAergic (gamma-amino benzoic acid) neurons may occur at the level of the dorsal horn of the spinal cord, thereby overriding any peripheral afferent input from a stump or neuroma.⁸ Epidural spinal cord stimulation (and even deep brain stimulation of periventricular gray and thalamus) is largely ineffective in treating phantom pain.^{9,10}

CENTRAL/CORTICAL

Reorganization of the somatosensory cortex has been shown to occur following amputation, with cortical regions that subserved the amputated part now taking over the representation of other body parts. If this altered functional schema persists, then pain too can persist. Peripheral interventions like regional plexus blockade have transiently eliminated phantom pain, which is speculated by some authors to reverse the cortical reorganization that typically follows amputation (although there is no clear reason why blockade should reverse cortical reorganization).¹¹ However, 20% of people with congenital limb deficiencies also report phantom sensations, often including pain, implying that there is a preexisting organization to the somatosensory cortex, perhaps with a genetic basis, that mediates this pain experience.¹² Limb pain that precedes the amputation (from preexisting disease or injury, or even from positional discomfort during the hours immediately preceding surgery) frequently resembles the phantom pain that develops after the surgery, perhaps because the engram or cortical somatosensory memory of limb pain has already been established prior to amputation.¹³

One promising synthesis of these neurologic mechanisms invokes neural nets to explain how input noise generated by dorsal root ganglion sensory neurons (themselves presumably driven by stump deafferentation) causes a reorganiza-

tion of cortical sensorimotor activity.¹⁴ Similarly, Melzack has proposed that the brain essentially creates phantom sensations: previous pain experiences set up a cortical “neuromatrix” or central pattern generator that continues to operate even when the peripheral input or limb itself is gone.¹²

MIND/BODY

Several psychological therapies which enhance mind/body coordination have been intermittently helpful. Numerous individual case reports of psychotherapy for phantom pain exist in the literature, but attempts to find specific and repeated psychologic patterns in phantom limb patients have failed.¹⁵ Psychodynamic theories have proposed that incomplete mourning for lost limbs creates this chronic pain as a somatic embodiment of the grief. Mind/body techniques like hypnosis and biofeedback have been somewhat helpful, the former presumably by facilitating a cognitive dissociation from unpleasant pain sensations, the latter possibly by diminishing sympathetic outflow that typically exacerbates pain perception.¹⁶⁻¹⁷

OVERVIEW OF SUBTLE ENERGY ANATOMY

Unfortunately, none of these interventions has been effective enough to become the clear treatment of choice for phantom pain. For a fuller explanation of phantom pain, I propose that we move beyond biomedical (and even mind/body) paradigms, to the realm of subtle energy. More complete reviews of this so-called energy medicine model can be found as regular features in such peer-reviewed journals as *Subtle Energies and Energy Medicine* and *Alternative Therapies*. Clinical and research studies have assessed the physical correlates of such purported subtle energy fields, whether electroencephalographic, biomagnetic, or psychophysiological; interactions at a distance and with *in vitro* cell preparations also suggest that placebo factors are not crucial. Attempts at theoretical synthesis abound.¹⁸⁻²³

Additionally, many medically oriented books for lay audiences provide surprisingly good overviews of related subtle energy topics and are good introductions to energy medicine.²⁴⁻²⁶ What follows is a synthesis of ancient tradition,

modern research and informed speculation. A complete model of subtle energy does not yet exist.

Suffice it to say that all of the world's healing systems, except for Western allopathic medicine, emphasize the role of a so-called "life energy" in maintaining health. This energy is known as "prana" in the yoga system, "qi" in Chinese medicine, "ruach" in Jewish mysticism, and it is even acknowledged in several notorious offshoots of Western medicine (the "Animal Magnetism" of Franz Mesmer, the "élan vital" of Henri Bergson, the "libido" of Sigmund Freud, and the "orgone" of Wilhelm Reich).

In this model, health is seen as a state of freely flowing vitality, and illness is marked by a blockage or imbalance of some sort in the natural ebb and flow of this energy. Many of these traditions also map out the specific routes by which this subtle energy is collected and travels, as exemplified by the acupuncture meridians of traditional Chinese medicine and the energy centers or chakras of the yoga system. Universal spiritual energy is somehow tapped into and "stepped down" in intensity by these subtle anatomic structures so that it can be used in the creation and maintenance of physical organisms. Therapies based on the manipulation of this energy include acupuncture, qigong, the laying-on-of-hands, Reiki, Therapeutic Touch and others.

In these therapies, vital energy is activated and directed by the therapist, whether through the stimulation of an acupuncture needle or an acupressure therapist's fingers, or, more subtly, through the seemingly magnetic influence of an energy healer's hands, either in direct physical contact (laying-on-of-hands) or in proximate contact (Therapeutic Touch and external qigong). The healer's intentionality and conscious control modulate subtle variations in his energetic "frequency" so that his energy output matches the nature of the disorder being treated. Modern research in bioelectromagnetism now seems to be validating this ancient model, by demonstrating electromagnetic correlates of these ancient subtle energy pathways. For example, acupuncture points can be mapped out with a simple galvanometer: the spots of lowered electrical resistance on the skin match important acupuncture points.²⁷ The acupuncture meridians seem to be electrophysiologic or functional pathways, rather than gross anatomic structures, which can serve as diffusion channels for charged ionic compounds somewhat like a magnetic tunnel.²⁰

The transduction mechanism by which this purported subtle energy interacts with physiology to create therapeutic effects is not clear. One intriguing area of study addresses the psycho-endocrinology of the chakras.²⁸ These seven major energy centers were introspectively allocated along the vertical spinal axis by yogic meditators several thousand years before anatomic dissection would discover endocrine glands that lie in the same spots. To be sure, other esoteric traditions differ somewhat in the location and number of these centers. But correlations between the psychospiritual function of each center and the endocrine function of the associated gland are uncanny. For example, the heart center energetically mediates selfless compassion for others, while its associated thymus gland regulates immune recognition of non-self; the mystical crown center aligns with the universal Cosmic energy of enlightenment, while the associated pineal gland entrains with circadian solar light energy; even non-meditators have noticed that feelings of sexual energy originate in the genital center where testosterone and estrogen are produced (Table I).

So each energy center converts the universal spiritual energy (by which we are hypothesized to be surrounded) into an appropriate energetic frequency. This energy is then transduced into a corresponding hormonal messenger to bring about physiologic changes. Each chakra functions like a step-down transformer, in the same way that high voltage electricity from a power plant must be successively stepped down to the 120 volt level that can be safely used by a house's electrical wiring.²⁹ Direct access to unmodulated spiritual energy by an unprepared person can effectively cause blown out biocircuitry, a phenomenon otherwise known as psychosis.

Table I

Energy Center (Chakra)	Endocrine Gland	Emotional Function	Energy Sensation
Crown	Pineal	Bliss	scalp tingling
Brow	Pituitary	Intuition	inner "lightbulb"
Throat	Thyroid	Truth	choking up
Heart	Thymus	Compassion	broken heart
Solar Plexus	Pancreas	Personal Power	"butterflies"
Genital	Gonads	Sexuality	sexual arousal
Root	Adrenal	Survival	"adrenaline rush"

Another aspect of this energy model is the energy field—an energy “aura” that seems to emanate from the body beyond the boundary of our skin. However, this aura is not simply a secondary side-effect created by the continuous stream of electrical activity within our nervous system (like the glow surrounding a light bulb). Rather, it is hypothesized that the aura is the primary source for our physical structure, the developmental blueprint from which cellular structures aggregate or coalesce.

A useful heuristic metaphor to clarify this counterintuitive causal notion involves a magnet and iron filings. When the filings line up along the invisible magnetic lines of force, they reveal an underlying organizational structure that is invisible to the naked eye. In a similar way, the meridians, nadis, and chakras of mystic medicine may serve as the ontogenic matrix within which, and in alignment with which, the physical body organizes and develops itself, cell by cell (or iron filing by iron filing). Sheldrake’s concept of morphic resonance—a sort of neo-Platonic Ideal, an energy pattern which generates both behaviors and structures—is another recent conceptualization of this matrix, a grid that may be fundamentally electromagnetic in nature.³⁰ And Green’s “copper wall” experiments clearly demonstrated that energy healers were able to trigger changes in their own magnetic fields, when they were electromagnetically insulated by surrounding copper walls from all ambient electromagnetic fluctuations.²¹

This concept of an electromagnetic blueprint is also grounded in the scientific literature on limb regeneration in salamanders and other species.³¹ A specific electromagnetic milieu is required for salamander limb regeneration; normal post-injury regrowth can be blocked if this so-called DC current of injury is altered. And more excitingly, if this negative DC potential can be created at the neuroepidermal junction of limb stumps in animals which do not normally regenerate (rats), unmistakable rudimentary limb regrowth occurs.³² Again, it seems as if the “morphogenetic field” proposed by 19th century embryologists may be the same matrix hypothesized here to underlie phantom pain. But this seemingly esoteric subtle energy aura can be detected in a simple experiential exercise:

Instructions. Place your hands in front of you, about two feet apart, palms facing each other. Begin to bring them closer together without actually touching. When your hands are close to each other, you can feel the familiar

temperature sensation of warmth. Now notice what other types of sensation you feel; close your eyes to help you focus. Move your hands back and forth, closer and further away, but particularly notice what you feel when your hands come to be 6-12 inches apart. You may begin to notice an unusual sensation that some have described as tingling or pressure-like or magnetic in nature. That's the subtle energy field.

The distance separating your hands when you first detect this feeling appears to measure the size of your aura. In other words, you've detected the feeling that is created when the outer boundary of your right hand's energy field bounces against your left hand's energy boundary. The distance between your palms equals twice the depth or thickness of your energy aura. Unfortunately, no studies have yet attempted to correlate this subjective sensation with simultaneous objective measurements of magnetic field strength. The intensity or size of this self-monitored field changes over time—compare this hand-to-hand distance on a day when you're happily enjoying your vacation with the distance when you're feeling sick and depleted. This low-tech measuring system is actually the first stage in developing the ability to monitor the health of your energy system, and that of other people. Energy healing is the next step in learning to master this dimension.

But there are several levels of density in the spectrum of subtle energies, levels that lie between the physical matter of our visible body and the highest auric emanations of our invisible spiritual body. Just as the chemical compound H₂O can exist in three discrete physical forms (ice, water and steam) depending on its level of thermal energy, so also can consciousness or life energy exist as several discrete levels or sheaths. The so-called “etheric body” mirrors the physical body in complexity, and lies one or two inches beyond the surface of the skin. It serves as the ideal template for the physical body. More subtle still is the larger astral body or layer of emotions, followed by the mental layer of thoughtforms, and finally by the all-encompassing halo of the Soul.

CLINICAL APPLICATIONS

The tactile sensation felt in the practice exercise is our most accessible method for detecting subtle energy's impact on our physiology. Like most subjective

phenomena, it is variable in reliability, but its precision can be enhanced by several types of widely available training for non-professionals.^{24,33} This type of manual energy focus also forms the basis for the energetic therapy used in the case studies to be described below. The modality employed, energy healing or the laying-on of hands, is a modified form of Therapeutic Touch, or TT.²⁶ This widely taught nursing intervention has been extensively studied (see reference 34 for an extensive bibliography), but has come under scrutiny recently in a widely publicized study in the *Journal of the American Medical Association* (JAMA) that was purported to prove that TT practitioners were unable to accurately detect this presumptive energy field.³⁴ This study has been severely criticized on methodologic, political and logical grounds.^{35,36} Most importantly, only one superficial parameter of TT was assessed, and in a non-clinical setting that did not evoke the required TT inner state of mind, so the accompanying editorial comments about TT's clinical ineffectiveness were entirely unsupported by the paper.

This attempt to discredit Therapeutic Touch is worthy of comment, because a promising research methodology was undermined by the experimenter's apparent ignorance of possible subtle energy interactions of the type being discussed in this paper. The subject, a TT practitioner, was asked to detect the energy field of the experimenter's hand while effectively blindfolded. Accuracy was found to be less than chance, but unfortunately no attempts were made to control for the experimenter's frame of mind or state of intentionality. Quite simply, this study did not control for the possibility that the experimenter might have consciously or unconsciously "damped down" her energy field beyond the range of detectability, as a result of her own frame of mind (skepticism, boredom, etc.). Regular practice of the self-monitoring exercise in this paper highlights this possible mind/field interaction. In 1962 an analogous hypnosis protocol led to measurable alterations in the bioelectric field around the subject's arm in response to mental imagery (this study will be discussed in more detail later).³⁷ Further, research has suggested the importance of providing regular feedback to the student in order to make effective any training in paranormal sensitivity.³⁸ Only when all of these subtle energy variables are controlled for can definitive conclusions be made about the existence of energy sensitivity or the effectiveness of any energy-based therapy.

Many illnesses have been treated with the modality of TT, and well-designed research has shown its efficacy in stimulating the healing of skin wounds and

of activating in vitro enzyme systems, among other variables studied.³⁹ A complete compendium of research on this and related energy therapies that have appeared in the peer-reviewed scientific literature has been compiled by Benor;⁴⁰ the authors of the JAMA study overlooked much important data.

The healing technique used in this study differs from Therapeutic Touch in that it incorporates direct physical contact to transmit healing energy, while at the same time encouraging guided inner imagery stimulated by a patient's heightened awareness of her own energy flow patterns. Several patients with phantom limb pain who were part of a comprehensive interdisciplinary pain management program at Spaulding Rehabilitation Hospital agreed to be treated with this approach. Three such vignettes follow.

Case 1. Mr. A., a 37 year old cargo loader, lost his left leg just below the knee after suffering a massive crush injury when a cargo dolly jackknifed onto his leg. He developed stump and phantom pain which was not responsive to two years of rehabilitation treatments, including such medications as opiates, calcium channel stabilizers and antidepressants to treat his concurrent major depression. Formerly an avid athlete, he appeared to withdraw from life due to the loss of his old self image as a hockey player and "tough guy." He was also quite invested in a Worker's Compensation suit against his former employer, which consumed much of his emotional energy.

He was offered a course of Therapeutic Touch largely because no intervention during his multidisciplinary pain program had been particularly effective. Much to the surprise of Mr. A. and myself, we could both detect the contact of my hand with his phantom limb. Mr. A. had his eyes closed during the treatment, which made the experience all the more impressive to both of us. Steady movements to draw the stuck energy out of his phantom leg caused a readily noticeable shift in his pain sensation, which he described as feeling like the pain was "draining" out of his leg. However, the healing process did not progress to complete analgesia.

He described this process of releasing his pain as being frightening to him. Somehow, he was holding on to the pain, and preventing it from totally leaving his body. He realized that if he could no longer feel any pain in his phantom leg, he would have to experience the true absence of his leg for the first time since his injury. In other words, he realized that he had never fully accepted the loss of his limb, because doing so would also involve accepting

the fact that he would never play hockey again. He stated quite clearly that he was not ready to proceed with further energy healing, because he wasn't yet ready to accept his disability. He was referred for a course of cognitive-behavioral psychotherapy to deal this reconceptualization, but he made little further progress. He relied on disability payments as his source of income and did not go through the emotionally painful process of mourning his losses and creating a new identity as a competent handicapped person.

Case 2. Ms. B. was a 65 year old widow whose severe diabetic peripheral vascular disease necessitated a below-the-knee amputation of her right leg. However, she apparently misunderstood her surgeon's plans, because she went into surgery with the expectation that only two of her toes would be removed (the painful and gangrenous ones). Needless to say, she was shocked to wake up and find her lower leg missing. Within hours of her recovery from surgical anesthesia, she developed phantom pain of the two toes she had expected to lose. The pain was not responsive to multiple medications, and one month into her post-operative rehabilitation program, I was called to see her about a possible depression.

She proved to be a very feisty yet trusting woman who was primarily upset that her esteemed surgeon had so misled her. Part of her psychotherapeutic work with me involved venting her frustration, and also communicating her distress directly to her surgeon. These conversations allowed her to feel as though a load was lifted from her shoulders, but her pain persisted. More dramatic results came with the application of direct energy healing.

She too was able to feel my hand as it moved along the phantom limb, and she also felt as though the pain was a substance that could be guided to drain out of her foot. The sensation was so light and gentle that she described it as "blowing in the wind" (even though she had never heard of Bob Dylan!). It was also accompanied by a vivid feeling of sky blue "relaxation" that flowed down her body, seeming to come from God before it moved down into her leg. As the phantom pain dissipated, she became more aware of the pain in her stump, and soon this too left. After our first energy healing session, she was pain free for the first time since surgery. However, the physical irritation of being fitted for a prosthetic leg and the emotional strain of a visit home led to a relapse of the pain. She then began to receive daily Therapeutic Touch sessions from her primary nurse, and learned to observe that her pain followed a predictable pattern. When she was tired or feeling stressed (by worrying about the well-being of her agitated and delirious roommate, for

example), her pain recurred shortly after each energy treatment. If she was well-rested and peaceful, she could be comfortable all day after the treatment. By the time of her discharge, she had learned to administer Therapeutic Touch to her own leg, and planned to seek follow up from another physician/healer in her community.

Case 3. Mr. C. was a 67 year old man who underwent a right below-the-knee amputation 17 years before admission to our clinic, because of peripheral vascular disease. He had suffered alcoholic neuropathy in both legs prior to surgery, and this neuropathic pain persisted in his phantom. He responded dramatically to TT treatment, with the pain on the dorsum of his foot seeming to drain out within 30 seconds of the onset of TT. Unlike the other two cases, neither he nor I sensed the energetic presence of the other's hand or foot during the treatment session. He slept uninterruptedly that night for the first time in years. His pain recurred when he returned for follow-up, but he was able to independently release it when he located a "drainage valve" near the ball of his phantom foot. Interestingly, this "valve" corresponded to the origin of the kidney acupuncture meridian, the so-called "bubbling well" that is a key intake point for life energy. Mr. C has not required further treatment since his initial course of 3 TT sessions.

DISCUSSION

MEASUREMENT OF SUBTLE ENERGY FIELDS

The notion that energy field abnormalities underlie phantom pain has recently been broached from speculative/experimental and philosophical/clinical perspectives.^{41,42} A key step in validating this energy model would be the development of objective rather than subjective methods to detect the purported energy field. Perhaps the best known of several technologies currently being explored for this purpose is called Kirlian photography, and was developed in the Soviet Union in the 1960's.²⁵ This lensless photography detects the electrostatic fields surrounding living organisms (and metallic objects) by creating a high voltage corona discharge that registers on a photosensitive recording plate.⁴³

Ongoing uncertainty about the role of artifacts (especially heat and moisture) in creating these photographic images has prevented a clear understanding of

the wide variability that surrounds Kirlian results.^{44,45} Unfortunately, since the original flurry of reports surfaced in the 1970's, funding for quality research in Kirlian photography has dried up, although the recent re-emergence of interest in subtle energies holds promise for better studies. Several Kirlian images have reached widespread public awareness: the multicolored glow around a handprint appears as a backdrop in the weekly introduction to the popular television show "The X-Files;" a glowing leaf aura appears on the cover of one well-known holistic medicine text.²⁵

However, despite these cautions about Kirlian's possibly artifactual nature, at least one recent well-controlled study has shown that noncontact energy therapies like Reiki, when directed at an isolated leaf, can magnify its Kirlian corona.⁴⁶ So even if the corona is an artifact rather than a subtle energy event, it can be reproducibly influenced at a distance—a non-local process or field must be invoked to explain this experimental result. Perhaps the most controversial aspect of the Kirlian literature, and the one most relevant to this paper, is the so-called "phantom leaf" effect.^{25(page 54)} A leaf is photographed after its tip has been cut off, and yet the leaf's surrounding energy field pattern is found to be unchanged by this "amputation." This phenomenon is inexplicable within the mechanistic biological paradigm, which can only hypothesize artifactual extracellular evaporation of water or intracellular ion flux to propagate an external electric field. However, there is no longer any accompanying leaf structure to generate the complete Kirlian aura of the phantom leaf effect. Apparently the energetic grid that supports the leaf tip still exists even after its physical counterpart has been removed. Currently, only anecdotal evidence supports the phantom leaf phenomenon, as existing evidence has not yet been accepted by mainstream scientific journals. But if ongoing studies show it to be non-artifactual in nature, then the subtle energy paradigm will have been given further significant confirmation. Most importantly for this paper, this Kirlian discovery provides a provocative potential model for understanding phantom sensations in human beings, by suggesting that phantom limbs are exact analogs of phantom leaves.

In other words, it is possible that phantom sensations (whether pleasant or painful) may be mediated in humans by the subtle energy body. The tip of the patient's limb (leaf) may have been snipped off via amputation, but

the intact corona grid can still transmit subtle energy sensations like pain. The physiologic nervous system may only be involved secondarily in phantom pain, when sensory nerves get stimulated by subtle energy imbalances that are large enough to exceed a certain activation threshold and thereby trigger the more “dense” end-organ sensory receptors. The peripheral nervous system that is missing anyway in phantom limbs appears not to be needed to transmit these bioenergy fluctuations to conscious awareness, because consciousness is not dependent on the nervous system. In the non-local view of consciousness that is now emerging, consciousness is seen not as an indirect by-product of a highly complex nervous system, but as a primary essence which “uses” the brain to manifest its intention in physical reality.⁴⁷ This non-neurologic human subtle anatomy may be the primary mediator of phantom limb pain.

POSSIBLE MECHANISMS OF ACTION

The triggering of neural sensory receptors by subtle energy fluctuations seems to be the process that occurred in the earlier exercise with hand sensitivity. With practice, healers and martial artists develop an exquisitely refined sensitivity to ever smaller degrees of energy flux. Phantom limb patients probably have only a normal degree of energy sensitivity, but because their energy imbalances are unfortunately so extreme, they experience the phantom pain all too clearly. To be sure, most sensory experiences in daily life are triggered by direct physical activation of our sensory receptor organs, but a surprising number of everyday sensations may actually be triggered by subtle energy fluxes of the sort which are presumed to mediate phantom limb pain. Examples include the feeling of being stared at (aka remote attention, and readily replicated in controlled laboratory settings), and the sense of personal space (when the outer boundary of your biofield bumps into the boundary of a stranger’s field). A host of gut feelings (including empathy, spine tinglings and heartfelt emotions) may reflect activation of various energy centers to such a degree that they can be detected physically (see Table I for some common examples: “heartache,” “butterflies in the stomach,” etc.).^{48,49} These are all examples of direct perception of qi, sensations that register in the CNS but originate as fluctuations of qi.

The question then arises: What might be a possible mechanism of action for this proposed interaction across the interface between subtle energy and biochemical energy? Several possibilities exist. Becker's model of an analog, direct-current, perineural nervous system which operates in tandem with the more commonly recognized digital neuronal nervous system is relevant here.⁵⁰ He has detected coordinated ion fluxes in the cells that support and surround neurons (the perineural glial cells, usually thought to be inert structural components). He has found that they function as a coordinated information transfer system that works in tandem with the binary, on/off CNS. This analog system of direct current fluxes is more prominent in primitive organisms that have only rudimentary nervous systems, and may be the evolutionary precursor of the CNS, one that was designed to function as an early warning system by detecting changes in external and internal electrical fields. In the human body, these DC shifts apparently trigger the pineal gland to secrete hormonal messages which entrain other important bodily functions and rhythms. This system represents one way in which subtle fluxlike electric field effects can interact with the hard wiring of our neurology.

Another possible mechanism for such qi-to-neuron interfacing would be the induction of neuronal action potentials by extrinsic biomagnetic fields that then generate electrochemical nerve transmission. This process is utilized in the new therapeutic technology of pulsed transcranial magnetic stimulation.⁵¹ Psychiatric syndromes like depression have been successfully treated by the application of external electromagnets to the brain that create a pulsating intracranial magnetic field, which is presumed to stimulate neurotransmitter release by the electromagnetic induction of synaptic action potentials. A similar though less intense process may be triggered by TT.

A third possible mechanism involves the phenomenon of piezo-electricity. In this process, the radio crystal converts the physical micromovements of sound vibrations into patterned electrical impulses; it can also reverse the direction of transduction by converting AM and FM radio waves into the sound vibrations of the speaker diaphragm. Similarly, the hydroxy-apatite crystal matrix of fascial tissue may generate, as it does in bone, a piezo-electric micro-current whenever the body's connective tissue is subjected to patterned micromovements.⁵² This current could presumably trigger nerve impulses that influence and pattern CNS function.

Biomagnetic or life-energetic patterns may conversely be stored as crystalline memory in the body's connective tissue matrix of fascia, perhaps by a reverse-directioned piezoelectric effect one writer has called "energy cysts."⁵³ And finally, the peripherally dispersed "body memories" of post-traumatic stress disorder, wherein the body appears to remember and store trauma as its way of "keeping score," may be another direct analogue of phantom pains in that neither sensation is primarily mediated by the cerebral cortex.⁵⁴ In trauma, when the body reshapes and remolds itself in protective reaction to injury, the newly sculptured fascial tissue matrix may become an independent peripheral source of altered electromagnetic activity, a connective tissue engram. Interestingly, previously forgotten traumatic memories are frequently rekindled by deep myofascial massage of the affected body parts or by energy therapies like acupuncture, as seen in our clinic and elsewhere.

One older study from the hypnosis literature alluded to earlier provides direct experimental support for this proposed biomagnetic mind/energy link.³⁵ Electrical field measurements were taken along the arms of patients who underwent traditional hypnotic inductions suggesting that they experience numbness in their hands (creating a condition known as glove anesthesia). Electric field gradient changes along the arm were detected that paralleled the location of the hypnotically suggested sensory changes, even though these altered gradients did not match any known nerve distribution pathways (*i.e.*, the radial and median nerves don't end abruptly at the wrist, where the numbness was suggested to begin and where the electrostatic changes were detected). In other words, electrostatic energy followed thought patterns, not nerve distribution patterns. Presumably this DC field effect was initially generated by qi fluxes that originated in the mind, when it was presented with the suggested hypnotic imagery. Unfortunately, the experimental apparatus was only calibrated to detect secondary electromagnetic changes rather than primary qi fluxes, because we still await technologies to measure qi directly.

It is important to reiterate that neurons are not a required component of this subtle energy model of phantom pain. The subtle energy biofield is anchored to the spinal cord and central nervous system via subtle anatomic structures like chakras and meridians which interpenetrated the physical body at all levels of the neuraxis. Information encoded in a highly configured subtle energy field can be directly inputted into the central nervous system at any level through

these interfaces, and it can also be accessed directly by conscious awareness, without the need for an intervening nervous system. This is presumably what occurs when qigong masters clear their energy channels simply by conscious intent, illustrating the traditional Chinese medical principle that “the mind moves the qi.” Again, awareness is not dependent on the mediation of the central nervous system, as a surprisingly large scientific literature on extrasensory perception makes clear. An exceptionally well researched review of this field exists.⁵⁵

Phantom pain can thus be seen as a sort of external engram that resembles Melzack’s “neuromatrix,” but is located in the biofield rather than in the CNS. The patient becomes aware of a primary source of information which is configured in the subtle energy field surrounding and interpenetrating his physical body, rather than in his central or peripheral nervous system. Understanding phantom pain, then, requires a theory of memory in which memories may be dispersed holographically in the biofield, rather than being simply contained in the brain. Leading theoreticians of this holographic view of mind and memory include Pribram, Grof and Talbot.⁵⁶⁻⁵⁸

CLINICAL ASPECTS OF THE ENERGY FIELD MODEL

Another clinical syndrome involving altered sensory perception may also be mediated by energy field imbalances. Pseudoneurologic symptoms like the numbness in this hypnotic protocol also appear spontaneously in patients with psychiatric conversion disorders. No organic defects are found in this functional syndrome that is felt to be a result of unconscious emotional conflicts. I hypothesize that these conflicts can be sufficiently disruptive to the energy field that sensorimotor perceptions are altered to create these otherwise baffling symptoms. For example, a traumatic memory imprint to “Forget you ever saw this!” may cause conversion blindness by functioning like the experimental hypnotic suggestion for hand numbness; electrostatic changes in the optic region might be detectable, and would reflect underlying qi imbalances. The hypnotic nature of this conversion process, in which traumatic memories are imprinted into the biofield, is reflected in Bruyere’s evocative term “the trauma trance.”⁵⁹ Hence, energy field disruptions might be created by some combina-

tion of both conscious and unconscious thought patterns and emotional conflicts, depending on the specific clinical situation. A misalignment in any layer of the field may disrupt the final common path of Kirlian biomagnetic balance, in phantom pain as well as in conversion disorder.

Theoretically, energetic blocks or imbalances of the sort which may trigger phantom limb pain can originate in any layer of the field, whether mental, emotional, etheric or physical, because these dimensions all interpenetrate and interact. The mystics said that energy follows thought, and Chinese medicine says that the mind directs qi. Sigmund Freud referred to this same process as the “cathexis of libido,” the investment of emotional energy in a person or object. However, cathexis now becomes a palpable physical experience rather than an arcane psychoanalytic metaphor.

So distortions in the biofield can be generated at each layer: by injury to the physical body (the pain reaction leads to a withdrawal of energy from the damaged part), by negative cognitions (repetitive self-criticism or thought patterns which drain someone of their personal power, or qi), by emotional stress (for example being trapped in an overly dependent relationship that sucks away one’s vitality; feeling a sense of shame about a particular body part or function), or by spiritual malaise (in which a sense of disconnection from God literally leaves one energetically depleted). These are the specific pathophysiologic energy mechanisms by which “biography becomes biology”, to use Myss’ epigram.⁶⁰ Similarly, discord at any of these energetic levels can account for the persistence of the phantom limb’s energy engram.

To apply these proposed mechanisms to our case examples, we can hypothesize that Mr. A.’s pain was maintained by his profound emotional attachment to, and self-identification with, his lost limb. He was not willing to shift his perspective in a way that might loosen his energetic bond to his leg, and so his pain persisted. Ms. B., on the other hand, was psychologically ready to accept her amputation, but she first need some standard psychotherapy to overcome the shock she experienced due to lack of adequate preoperative preparation. This psychologic work set the stage for fuller “letting go” of the limb, as energy healing allowed the process of disengagement to happen more concretely and completely. Mr. C. gave no particular indication that he would respond so dramatically to treatment, although post hoc reasoning can explain

the speed of his response by hypothesizing that he was emotionally and psychologically “ready” to release the pain engram, once the energetic catalyst was provided in treatment. He had no prior knowledge of acupuncture meridians, so his proprioceptive sense that energy flowed through a key acupuncture point is certainly intriguing.

It seems likely that other new therapies for trauma release like EMDR (Eye Movement Desensitization and Reprocessing) and Callahan Thought Field Therapy (TFT) also share an energy-based mechanism of action since current attempts to explain these unorthodox therapies using concepts from cognitive psychology or brain physiology appear inadequate.^{61,62} Both EMDR and TFT seem to energetically disconnect memory from affect, so that traumatic memories can be experienced without an attendant flood of emotion. The disconnection process may be triggered by acupressure stimulation of acupuncture meridians that have been holding blockages of emotional energy (TFT), or by shifts in visual cathexis that enable the ego to disengage from traumatic residues (EMDR). Both techniques seem to facilitate this realignment of the traumatically entangled layers of the energy field by removing obstacles to the inherent homeostatic tendency of the organism to seek energetic balance.

EXPLANATORY POWER OF THE ENERGY FIELD MODEL

This energy field hypothesis of phantom sensation predicts that therapeutic interventions from the biomedical armamentarium which leave out the intervening variable of subtle energy will be necessarily incomplete and therefore unsuccessful. Only treatments which directly modify blockages in the subtle energy field will be clinically successful. Since blocks can occur in any of the four main levels in the energy field, all dimensions of subtle energy would have to be addressable by any potentially useful healing technique for phantom pain. Interestingly, there is no consistent literature on the use of acupuncture and homeopathy with phantom pain beyond anecdotal case reports.⁶³ Perhaps the absence of adjunctive psychotherapy in these cases prevented full release and healing on all four levels, given that acupuncture, for example, focuses only on etheric blockages and contains no specific methodology for working with any associated emotional content.

In the light of this subtle energy field hypothesis, let us now reconsider several aspects of the phantom phenomenon that were mentioned earlier in the paper, as a test of the model's explanatory powers.

1. **Perception of congenitally absent limbs:** Genetic defects are seen as preventing accurate translation of the energy matrix into physical form, even though the non-physical matrix itself is still intact. The limb absence is due to a shortcoming in the genetic transcription mechanism, rather than to any gap in the energy matrix itself. Thus sensations generated in an intact energy matrix would still be discernable to the person born with an absent limb, even though the physical apparatus and its neurologic interconnections are missing.
2. **Paraplegic detection of phantoms:** Again, neurology is not needed to detect subtle energy fluxes. As long as there is an intact subtle nervous system involved in this process, even patients with transected spinal cords can experience phantom sensations (they cannot experience heat, pressure or any other sensory modality that does require a specific intact neuronal pathway). These other sensory modalities aren't fine-tuned enough to respond to subtle energy fluxes, but are only activated by more tangible and concrete changes in the physical environment (thermal energy, physical vibration, etc.).
3. **Resemblance of phantom pain to pre-amputation pain memories:** Pre-amputation pain memories presumably can be encoded within the organized subtle energy field, and can be sustained as the patient's way of "holding on" to a lost body part (as with Ms. B.). Preoperative emotional distress may heighten the significance of otherwise trivial positional discomfort, which then gets embedded or imprinted into the energy field as a permanent external engram. In corroboration of this, the intensity of pre-operative pain has been shown to correlate with the severity of post-operative phantom pain.⁶⁴ The energy model predicts that pre-operative pain would disrupt the external energy field more lastingly. Conversely, the minority of post-amputation patients who don't go on to suffer phantom pain would be predicted not to have suffered significant preoperative pain or emotional upheaval.
4. **Medication effects:** The therapeutic benefits of medications like clonazepam may derive from their ability to damp down the patient's sensitivity to subtle energy and thereby impair detection of painful subtle

energy field imbalances. Ketamine is known to induce dissociation (and is therefore no longer used in general anesthesia), and this dissociative mechanism may explain its occasionally beneficial effects with phantom pain—patients may be too disconnected from their energy field to detect imbalances that would normally be extreme enough to experience as painful.

5. **Patients' subjective experiences during Therapeutic Touch:** Perhaps the most explicit validator of the energy model was the ability of two patients to detect Therapeutic Touch “contact” even with their eyes closed. Any proposed model of phantom sensation must be able to incorporate this experience, but by definition a neurologically-based model cannot do so, because the patients had no intact sensory receptors to feel my hand's therapeutic touch.
6. **Healer's subjective experiences during Therapeutic Touch:** Similarly, my ability to sense the boundaries of my patients' phantom limbs demonstrated to me the validity of the energy field construct. Again, the medical model assumes that I was waving my hands in empty space. Of course, blinded testing would more accurately assess this phenomenon by ruling out the role of my own expectations and self-deception. Similarly, the JAMA study on Therapeutic Touch provides one prototype for further research on this question.³⁴ An earlier methodologically tighter study that produced positive results was not referenced in the JAMA study.⁶⁵
7. **Assessing the role of hypnotic responsiveness.** To ensure that suggestibility is not the overriding factor in these clinical cases, baseline assessments of patients' hypnotic susceptibility can be readily obtained. Correlating hypnotizability with clinical response to TT would clarify whether hypnosis or subtle energy flow is the primary mechanism of action for TT.

FUTURE RESEARCH

Several fairly clear cut experiments, expanding along the lines originally suggested by Sheldrake,^(41,Chapter 5) can help to evaluate the predictive power of this model.

1. **Kirlian photography of amputees.** No literature exists regarding the Kirlian images that human amputees generate, but one pilot study is underway.⁶⁶

The energy model predicts that all amputees would have Kirlian coronas, as should those born with congenitally absent limbs. However, pain-free amputees should have a more quiescent energy corona, while amputees with persistent phantom pain should have an intensified Kirlian pattern that would return to baseline only after successful treatment of the phantom pain. Changes over time in Kirlian photos of phantom pain patients who refuse energy treatments would also be instructive, to help understand the natural course of this disorder. PET scans and functional MRI studies could document cortical correlates of these processes.

2. **Predisposing emotional factors.** Previous research into psychogenic factors of phantom pain have been somewhat generic in nature, categorizing patients on rather broad items of personality style.⁶⁷ It would be more useful to know whether specific psychodynamic issues are active in any given patient's history, but this is not the sort of information that a treating neurologist or anesthesiologist usually obtains. The energy model predicts that certain psychodynamic themes would be more common in amputee patients with phantom pain than in amputee patients without pain. Such issues as incomplete mourning, suddenness of loss, lack of adequate psychological preparation for the procedure and secondary gain could all lead to the maintenance of energetic bonds to the lost limb that would keep the energy field activated. These factors could be examined by comparing matched groups of amputees via in-depth psychodynamic assessment of these issues. Comparisons between pain free and phantom pain amputees could also be made.

3. **Prevention of phantom pain.** Pre-emptive treatments such as preoperative and postoperative regional anesthesia appear promising as ways to prevent the development of phantom pain.⁶⁴ This approach may work by preventing nociception that might otherwise create pre or post operative emotional turmoil of an intensity that could derange the energy neuromatrix. Preemptive anesthesia facilitates the patient's ability to energetically release the amputated limb. A similar preventive approach using Therapeutic Touch or related energy healing methods could be implemented preoperatively. A single-blind comparison group method would be a logical first step, since methodology for use of sham Therapeutic Touch does exist, and would serve to generate more rigorously controlled data.⁶⁴

4. **Validity of healer's sensations.** Selected energy healers could be asked to assess phantom energy fields under several experimental conditions: while

blindfolded; without knowing whether a given amputee patient had phantom pain or was pain free, etc. Practice effects and skill differentials would become evident; and would help energy therapists to become more accurate diagnosticians.

5. **Corroboration of energy patterns.** Medical clairvoyants could be utilized to analyze in specific detail energy field imbalances that characterize this disorder. The work of Bruyere and Brennan is particularly relevant in this regard, as important psychosocial and medical data can apparently be “read” directly from the energy field by trained or gifted sensitives.^{57,24} Intuitive diagnoses could be matched with information obtained from standard psychiatric interviews to assess the importance of psychodynamic issues in maintaining energy field imbalances. One pilot study of intuitive diagnosis of general medical syndromes appeared promising, while another has been criticized for methodologic problems.⁷⁰⁻⁷²

CONCLUSION

The study of phantom limb pain provides another window into the shortcomings of the mechanistic biomedical model, as it highlights the potential advantages of an expanded multidimensional energy-based perspective. The therapeutic implications of this proposed form of subtle energy manipulation are significant, as it offers the possibility of dramatic therapeutic impact by addressing the energetic underpinnings of this fairly common disorder. The subjective experiences of patients and healers clearly require an expanded understanding of human consciousness that does not see awareness as contained in, or generated by, the central nervous system. Other complementary and alternative medical therapies can be similarly assessed to determine which aspect of subtle anatomy is being impacted, leading to the possibility of more finely focussed energy diagnoses and treatments. The actual mechanism(s) by which qi and physiology interact promises to be a fascinating new arena for research as the field of energetic pathophysiology takes shape. Hopefully, further research along the lines suggested in this paper can answer more definitively the questions that have been raised by applying an ancient/modern healing technique to an old and enigmatic medical syndrome.

• • •

CORRESPONDENCE: Eric Leskowitz, M.D. • 23 Tolman Street • Needham, MA 02492-1658 • Email: Rleskowitz@pol.net

REFERENCES & NOTES

1. J. Kao, J. A. Wesolowski, & M. J. Lema, Phantom Pain: Current Insights Into its Neuropathophysiology and Therapy, *Pain Digest* 7 (1997), pp. 333-345.
2. Karsten Kroner, Borg Krebs, Jesper Skov & Hans Jorgensen, Immediate and Long-Term Phantom Breast Syndrome After Mastectomy, *Pain* 36 (1989), pp 327-334.
3. Ronald Melzack, Phantom Limbs, *Scientific American* (April, 1992), pp. 120-126.
4. Richard A. Sherman, Stump and Phantom Limb Pain, *Neurological Clinician* 7 (1989), pp. 249-264.
5. Ronald Melzack & John D. Loeser, Phantom Body Pain in Paraplegics: Evidence for a Central "Pattern Generating Mechanism" for Pain, *Pain* 4 (1978), pp. 195-210.
6. L. Nikolajsen, C. L. Hansen, J. Nielsen, J. Keller, L. Arendt-Nielsen & T. Jensen, The Effect of Ketamine on Phantom Pain: A Central Neuropathic Disorder Maintained by Peripheral Input, *Pain* 67,1 (September, 1996), pp. 69-77.
7. C. Tsuji, T. Saito & K. Hatano, Leg Pain Under Spinal Anesthesia in Leprosy Patients, *Masui* 46,5 (1997), pp. 704-707. (Japanese)
8. Scott L. Bartusch, Jeff Sanders, John D'Alessio & Jeffrey Jernigan, Clonazepam for the Treatment of Lancing Phantom Limb Pain, *Clinical Journal of Pain* 12 (1996), pp. 59-62.
9. P. Lang, The Treatment of Chronic Pain by Epidural Spinal Cord Stimulation—A 15 Year Follow-up, *Axone* 18,4 (1997), pp. 71-73.
10. K. Kumar, C. Toth & R. K. Nath, Deep Brain Stimulation for Intractable Pain: A 15 Year Experience, *Neurosurgery* 40,4 (1997), pp. 736-746.
11. L. Birbaumer, Effects of Regional Anesthesia on Phantom Limb Pain are Mirrored in Changes in Cortical Reorganization, *Journal of Neuroscience* July 15, 17,14 (1997), pp. 5503-5508.
12. Ronald Melzack, Phantom Limbs in People with Congenital Limb Deficiency or Amputation in Early Childhood, *Brain* 120,Pt 90 (September, (1997), pp. 1603-1620.
13. Joel Katz & Ronald Melzack, Pain "Memories" in Phantom Limbs: Review and Clinical Observations, *Pain* 43 (1990), pp. 319-336.
14. M. Spitzer, P. Bohler, W. Weisbrod & U. Kischka, A Neural Network Model of Phantom Limb, *Bio Cyber* 72,3 (1995), pp. 197-206.
15. Richard A. Sherman, Stump and Phantom Limb Pain, *Neurological Clinician* 7 (1989), pp. 249-264.
16. M. Muraoka, H. Kimiyama, M. Hosoi, K. Mini & C. Kubo, Psychosomatic Treatment of Phantom Limb Pain with Post-Traumatic Stress Disorder, *Pain* 66,2-3 (1996), pp. 385-388.
17. Richard A. Sherman, Case Reports of Treatment of Phantom Limb Pain with a Combination of EMG Biofeedback and Verbal Relaxation Techniques, *Biofeedback & Self Regulation* 1 (1976), p. 353.
18. Jacob Grinburg-Zylberman Human Communication and the Electrophysiologic Activity of the Brain, *Subtle Energies* 1,33 pp. 25-44.
19. William Braud, Consciousness in Remote Biological Systems: Anomalous Intentionality Effects, *Subtle Energies* 2,3 (1991), pp. 69-94.

20. Beverly Rubik, Can Western Science Provide a Foundation for Acupuncture? *Alternative Therapies* 1,4 (1995), pp. 41-47.
21. Elmer Green, Peter Parks, Paul Gruyer, Steven Fahrion & Lolafaye Coyne, Anomalous Electrostatic Phenomena in Exceptional Subjects, *Subtle Energies* 2,3 (1992), pp. 69-94.
22. David Muehsam, M. S. Markov, Patricia Muehsam, Arthur A. Pilla, Ronger Shen & Yi Wu, Effects of Qigong on Cell-Free Myosin Phosphorylation: Preliminary Results, *Subtle Energies* 5,1 (1994), pp. 93-108.
23. Larry Dossey, Healing, Energy and Consciousness: Into the Future or Retreat to the Past? *Subtle Energies*, 5,1 (1994), pp. 1-33.
24. Barbara Brennan, *Hands of Light* (Bantam New Age, New York, NY, 1988).
25. Richard Gerber, *Vibrational Medicine* (Bear and Co., Santa Fe, NM, 1990).
26. Dolores Krieger, *The Therapeutic Touch: How to Use Your Hands to Help or to Heal* (Prentice Hall Press, New York, NY, 1979).
27. Robert Becker, Acupuncture Points Show Increased DC Electrical Conductivity. *American Journal of Chinese Medicine* (1976), pp. 4-69.
28. Eric Leskowitz, Life Energy and Western Medicine, *Advances* 8,1 (1992), pp. 63-67.
29. William Tiller, What Are Subtle Energies? *Journal of Scientific Exploration* 7,3 (1993), pp. 293-304.
30. Rupert Sheldrake, *The Presence of the Past: Morphic Resonance and the Habits of Nature* (Time Books, New York, NY, 1988).
31. Robert Becker & G. Selden, *The Body Electric: Electromagnetism and the Foundation of Life* (Quill Books, New York, NY, 1985).
32. Robert Becker, Stimulation of Partial Limb Regeneration in Rats, *Nature* 235 (1972), pp. 109-111.
33. Belleruth Naparstek, *Your Sixth Sense: Activating Your Psychic Potential* (HarperCollins, New York, NY, 1997).
34. Linda Rosa, Emily Rosa, Larry Sarner & Stephen Barrett, A Close Look at Therapeutic Touch, *Journal of the American Medical Association*, (1998), pp. 1005-1010.
35. Jeanne Achterberg, Clearing the Air in the Therapeutic Touch Controversy, *Alternative Therapies* 4,4 (1998), pp. 100-101.
36. Eric Leskowitz, Un-Debunking Therapeutic Touch, *Alternative Therapies* 4,4 (1998), pp.101-102.
37. H. Friedman, *et al*, Direct Current Potential in Hypnoanalgesia, *Archives of General Psychiatry* 7 (1962), p. 193.
38. Charles Tart, Card Guessing Testing: Learning Extinction Paradigm, *American Society for Psychical Research* 60 (1966), pp. 46-55.
39. Daniel Wirth, The Effect of Non-Contact Therapeutic Touch on the Rate of Healing of Full Thickness Dermal Wounds, *Subtle Energies* 1,1 (1990), pp. 1-20.
40. Daniel Benor, *Healing Research* (Helix Verlag, Munich, Germany, 1992).
41. Rupert Sheldrake, *Seven Experiments That Could Change the World: A Do-It-Yourself Guide to Revolutionary Science* (Riverhead Books, New York, NY, 1995).
42. R. C. Biley, Rogerian Science, Phantoms and Therapeutic Touch: Exploring Potentials, *Nurses Scientific Quarterly* 9,4 (1996), pp. 165-169.
43. D. Boyers & William Tiller, Corona Discharge Photography, *Journal of Applied Physics* 44,7 (1973), pp. 3102-3112.
44. M. Stanwick, Aura Photography: Mundane Physics or Diagnostic Tool? *Nursing Times* 92,24 (1996), pp. 39-41.
45. C. Boxler & A. Paulson, Kirlian Photography: A New Tool in Biological Research? *Journal of Biological Photography Association* 45,2 (1977), pp. 51-60.

46. H. Sugano, S. Uchida & I. Kuramoto, A New Approach to the Studies of Subtle Energies, *Subtle Energies* 5,2 (1994), pp. 143-166.
47. Larry Dossey, *Recovering the Soul: A Scientific and Spiritual Search* (Bantam Books, New York, NY, 1989).
48. William Braud, D. Shafer & S. Andrews, Reactions to an Unseen Gaze (Remote Attention): A Review with New Data on Autonomic Staring Detection, *Journal of Parapsychology* 57 (1993), pp. 373-390.
49. John Tatum, Clinical Intuition and Energy Field Resonance, In (Eric Leskowitz, Ed., *Transpersonal Hypnosis*, CRC Press, Boca Raton, FL [in press]).
50. Robert Becker, *Cross Currents: The Perils of Electropollution and the Promise of Electromedicine* (Jeremy Tarcher, Los Angeles, CA, 1990).
51. M. Kircaldie et al., Transcranial Magnetic Stimulation as Therapy for Depression and Other Disorders, *Aust NZ J Psychiatry* 31,2 (1997) pp. 264-272.
52. L. Lavine & A. Grodzinsky, Electrical Stimulation of Repair of Bone, *Journal of Bone Joint Surgeons of America* 69,4 (1987), pp. 626-630.
53. John Upledger, *SomatoEmotional Release and Beyond* (UI Publishing, Palm Beach, FL, 1990).
54. Bessel van der Kolk, The Body Keeps the Score, Memory and the Evolving Psychobiology of Post Traumatic Stress, *Harvard Review of Psychiatry* 1,5 (1994), pp. 253-265.
55. Dean Radin, *The Conscious Universe: The Scientific Truth of Psychic Phenomena* (Harper Edge, New York, NY., 1997).
56. Karl Pribram, Cognitive Revolution and Mind/Brain Issues, *American Psychologist* 41,5 (1986), pp. 507-520.
57. Stanislaw Grof, *The Holotropic Mind* (Harper, San Francisco, CA, 1993).
58. Michael Talbot, *The Holographic Universe* (HarperPerennial, New York, NY, 1991).
59. Rosalyn Bruyere, "The Trauma Trance", lecture, Williamstown MA, 1994; based on Chapter 9, "Traumas and DC Shifts", In (*Wheels of Light: Chakras. Auras and the Healing Energy of the Body*, Fireside Books, New York, NY, 1994).
60. Caroline Myss, *Anatomy of the Spirit: The Seven Stages of Power and Healing* (Harmony Books, New York, NY, 1996).
61. F. Shapiro, *EMDR: Basic Principles, Protocols and Procedures* (Guilford Press, New York, NY, 1995).
62. See Callahan TFT homepage at: <http://www.tftrx.com>
63. Tony Lu, Acupuncture Treatment for Phantom Limb Pain, *Alternative Therapy* 4,5 (1998), pp. 124-125.
64. R. Dworkin, Which Individuals with Acute Pain Are Most Likely to Develop a Chronic Pain Syndrome? *Pain Forum* 6,2 (1997), pp. 127-136.
65. Gary Schwartz, Linda Russek & Justin Beltran, Interpersonal Hand-Energy Registration: Evidence for Implicit Performance and Perception, *Subtle Energies* 6,3 (1995), pp. 183-201.
66. H. Sugano, (MOA Health Science Foundation, Fukuoka, Japan), Personal communication, January 27, 1998.
67. R. A. Sherman, C. J. Sherman & G. M. Bruno, Psychological Factors Influencing Chronic Phantom Limb Pain: An Analysis of the Literature, *Pain* 21 (1985), pp. 91-97.
68. Joel Katz, Prevention of Phantom Limb Pain by Regional Anaesthesia, *Lancet* 349 (1997), pp. 519-520.
69. Stephanie Mulloney & C. Wells-Federman, Therapeutic Touch: A Healing Modality, *Journal of Cardiovascular Nursing* 10,3 (1996), pp. 27-49.
70. Daniel Benor, Intuitive Diagnosis, *Subtle Energies* 3,2 (1992), pp. 41-64.

71. D. Young, & S. Aung, An Experimental Test of Psychic Diagnosis of Disease, *Journal Alternative Complementary Medicine* 3,1 (1997), pp. 39-53.
72. K. Jobst, One Man's Meat is Another Man's Poison: The Challenge of Psychic/Intuitive Diagnosis to the Diagnostic Paradigm of Orthodox Medical Science, *Journal Alternative Complimentary Medicine* 3,1 (1997), pp. 1-3.
73. Daniel Benor, *Spiritual Healing: Does It Work? Science Says Yes!* (Vision Publications, Southfield, MI, In Press).

∞ ∞ ∞