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TRADTIONAL BELIEFS AND ELECTROMAGNETIC FIELDS

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SUMMARY:

The author proposes that a wide range of traditional beliefs and practices may provide clues to real electromagnetic field interactions in the biosphere. For instance, evil eye beliefs may be a cultural elaboration of the sense of being stared at, which in turn may have a basis in real electromagnetic emissions through the eye. Data to support this hypothesis are presented. Other traditional beliefs such as remote sensing of game and the importance of connection to the Earth Mother may also contain a kernel of truth. A series of testable scientific hypotheses concerning traditional beliefs and electromagnetic fields is presented. At this stage, the theory does not have sufficient evidence to be accepted as proven; its purpose is to stimulate thought and research.

KEY WORDS:

Traditional beliefs, electromagnetic fields, human ocular extramission.

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This paper provides a foundation for a new branch of anthropology, one focused on the relationship between traditional beliefs and electromagnetic fields. The theory of human energy fields (Ross, 2009) makes specific testable predictions in a number of areas including anthropology, physiology, medicine, psychotherapy, agriculture, weapons development and security systems. Examples of the anthropological hypotheses derived from the theory are elaborated below. At this point in time, there is insufficient evidence available to provide a definitive test of the theory. The purpose of the theory of human energy fields, at this stage in its development, is to stimulate thought and research that might not otherwise be undertaken. The theory does not attempt to explain all aspects of the phenomena considered below. Rather, the author proposes a new approach to anthropology that might complement and enhance current methods of study in the field.

General principles of the theory of human energy fields

The theory of human energy fields (Ross, 2009; 2010a; 2010b; in press) is based on a set of hypotheses. At a philosophical level, the core assumption is that the electromagnetic (EM) field of the human body is what in different cultures has been called "human spirit," "soul," "chi energy," "aura" or "life force". The latter, according to the theory, are traditional terms for the energy field we study with modern technology such as electrocardiograph (EKG) and electroencephalograph (EEG) machines. This assumption, however, does not have to be accepted for the practical applications of the theory to be pursued.

In medicine, several predictions follow from the theory. First, the theory predicts that medically relevant information is available in the EM field of the body as a whole, not just the brain and heart fields. This information can be detected, analyzed and used clinically just like the information emanating from the heart and brain. Disease states could, in principle, be detected at the EM level before they manifest themselves as biological disease at the cellular and tissue levels. This is already true for EKGs and EEGs – I am simply expanding the field of EM data collection to the body as a whole.

In general physiology, the theory proposes that mind is associated not just with the brain, but with the body as a whole including especially the major peripheral nerve ganglia such as the cardiac, celiac and hypogastric plexes; future EM scanning equipment might be able to gather meaningful data about dysfunction in these plexes. For example, the

theory predicts that "gut feelings" and "I feel it in my heart" are not simply metaphors. Rather, they are a subjective acknowledgement of real electrophysiological processes. Environmental threat data are processed by the brain, transmitted to the abdominal plexes for further processing, and transmitted back up to the brain for yet further processing and conscious registration. In this model, "unconscious" processing centers are not just in the limbic system and posterior aspects of the cerebral cortex, but also in the peripheral nervous system. This hypothesis could be tested with equipment that could monitor two-way EM signal traffic between the brain and the abdomen.

In psychology there are anxiety disorders such as panic disorder that include gastrointestinal symptoms like stomach upset or "butterflies in the stomach." The theory of human energy fields predicts that there are measurable EM disturbances in the hypogastric plexus in fear and hyper-arousal states, including basic mammalian predator threat-response states. Biofeedback and neurofeedback desensitization treatment protocols could potentially be directed at peripheral nerve ganglia, not just the brain.

Within psychiatry, the theory postulates that many psychiatric disorders are whole body EM disorders, not just brain diseases. A whole body EM scanner would show a marked difference of the energy field of a person in a manic state, compared to the same person in a depressed state, for example.

More generally, the theory proposes that the biosphere evolved within the EM field of the earth. The EM field of the earth is not just background noise, rather it is a fundamental source of psychological nourishment, energy and rootedness. In physiological terms, being grounded to the earth may assist in neutralization of free radicals, and therefore the maintenance of health. In more traditional language, we need connection with the Earth Mother in order to feel real and alive. The emptiness of modern civilization, then, is in part due to a real EM disconnection from the earth main field, caused by insulated shoes, concrete roads and the general EM pollution of cities. This disconnection from the earth is simultaneously an anthropological, a physiological and a public health problem. These are different languages for and different approaches to the same underlying reality.

Likewise, the theory proposes that EM signal traffic between organisms in the biosphere is not just meaningless background noise. Just as sharks, rays, homing pigeons and bees use the earth's magnetic field for navigation, so too do mammals sense and detect each other remotely

through EM signal traffic. This signal detection capacity has been selected for during evolution. Such signal traffic is entirely normal and can be studied scientifically. It is not "mental telepathy" because the signals are not generated solely by the cerebral cortex. They are whole body signals with sub-signals originating from the major nerve ganglia and the brain.

According to the theory, the apparently "magical" and "superstitious" beliefs of traditional cultures can be seen as clues to an underlying real electrophysiology. This physiology has internal aspects within the organism and external aspects between the organism and the environment. In the modern world, we have lost touch with this signal traffic because we are taught to invalidate it, because it no longer has immediate survival advantage, through disuse, and because we are swamped with too much background EM pollution.

The extramission theory of vision and evil eye beliefs: testing the theory

There have been two basic models of visual perception in western civilization: intromission theory and extramission theory. According to intromission theory, which has been endorsed by western science since at least the thirteenth century (Winer & Cottrell, 1996; Winer, Cottrell, Gregg, Fournier, & Bica, 2002; Winer, Cottrell, Gregg, Fournier, & Bica, 2003), visual perception is based on light entering the eye and there is no emission signal of any kind. According to extramission theory (Winer & Cottrell, 1996; Winer, Cottrell, Gregg, Fournier, & Bica, 2002; Winer, Cottrell, Gregg, Fournier, & Bica, 2003), the eyes do emit energy of some kind, and this emission is involved in visual perception. Intromission and extramission need not be mutually exclusive models, but nevertheless all aspects of extramission theory are rejected by western science. (Schrodinger, 1953; Toulmin, 1967; Winer & Cottrell, 1996; Winer, Cottrell, Gregg, Fournier, & Bica, 2002; Winer, Cottrell, Gregg, Fournier, & Bica, 2003).

The theory of human energy fields predicts that there is partial validity to the extramission theory of visual perception, which has three components: 1) there is an energy emission of some kind from the eyes 2) this energy beam interacts with objects in the outside world, and 3) this interaction plays a role in visual perception.

The idea that human ocular extramission may interact with objects and organisms in the outside world is not actually particularly strange, once it is put in context. For instance, imagine a helicopter emitting sound

beats and windows vibrating with these beats. The waves of the helicopter are really having an interaction with the windows in our houses. The windows might even break. This is what happens with the extramission waves that come from our eyes. They can also interact with other objects and with other persons, although their effect is much more subtle because the signal is much weaker than the sound waves emanating from a helicopter.

The theory of human energy fields predicts that there is an EM emission through the eyes that can be detected remotely. Currently, in neurology, brain waves can be detected with electroencephalogram (EEG) electrodes applied to the scalp; in cardiology, the EM emissions of the heart are detected with electrodes applied to the chest. These signals do not stop at the skin, however; they are propagated out into space. Electrical engineers in England have taken an electrocardiogram (EKG) from three feet away using a high-impedance electrode that makes no physical contact with the body, and they have measured the EEG from a shorter distance away using similar non-contact electrodes (Harland, Clark, & Prance, 2002; Harland, Clark, & Prance, 2002; Prance, Beardsmore-Rust, Aydin, Harland, & Prance, 2008; Prance, Debray, Clark, Prance, Nock, Harland, & Clippingdale, 2000).

It is an established scientific fact, then, that EM emissions from the brain and heart travel out into space and can interact with objects in the outside world, such as electrodes. These emissions contain physiologically meaningful information that can be used to make diagnoses and plan treatment in cardiology and neurology. One might think that brain waves and other human EM signals do not travel very far in external space due to the inverse square law, according to which the intensity of an EM signal drops off with the square of the distance. However, the inverse square law does not apply to very low frequency signals in the 1-60 Hertz range, which is the frequency level at which brain waves are measured (Barr, Jones, & Rodger, 2000). At these frequencies there is negligible drop-off in the signal at 1.000 kilometers.

Brain waves emitted through the eye can be detected by high-impedance electrodes that make no contact with the body. How far away this signal can be detected depends on the sensitivity of the electrodes and the necessary software development. Human ocular extramission has greater amplitude or intensity than the general field emitted through the skull because it does not have to pass through the skull. For this reason, and perhaps due to conscious focusing, the geometry of the skull, and the presence of the optic nerve terminal in the retina, the signal emerging

through the eyes has greater amplitude and a beam-like distribution in space.

Human ocular extramission, is the foundation of the sense of being stared at (Freeman, 2005; Sheldrake, 2003; 2005a; 2005b). We know that there are photon detectors in human skin because the skin captures light in order to synthesize Vitamin D and melanin, just as plants capture photons to synthesize chlorophyll. It is a proven fact, then, that there are physiologically active EM signal receptors in human skin.

The sense of being stared at was selected for during evolution as a component of predator-prey interactions. The gazelle that could sense the stare of a lion would take evasive action and would survive; the genes conferring this survival advantage would be selected for over millennia. The gazelle need not register the stare consciously; it need only experience a sense of foreboding, danger, or restlessness or of being ill-at-ease for it to take flight. The signal detection could be largely sub-threshold or subliminal.

Over time we industrialized humans have lost the sense of being stared at due to cultural pressures to discredit and ignore it, disuse and the EM pollution of modern cities, which make the extramission signal undetectable due to background noise. However, the sense of being stared at persists in disguised form in evil eye beliefs. Such beliefs are a culturally constructed memory or trace of the sense of being stared at by predators, which carries with it the core symptoms of "evil eye sickness:" a sense of foreboding, danger, disease or impending death (Dundes, 1981; Elworthy, 2004; Maloney, 1976).

According to traditional evil eye beliefs the eye emits a beam of some kind that can harm other people. This can be done either on purpose or accidentally by people who are jettatore, the Italian term for those who can cast the evil eye. Evil eye beliefs depend on the theory of human ocular extramission, according to which there is an emission of some kind from the eyes. According to the theory of human energy fields, traditional evil eye beliefs contain a kernel of truth.

In order to test this theory, a device that emits a signal mimicking human ocular extramission could be constructed. The device would have a variable amplitude that could be adjusted upwards till anyone could detect the signal. This is analogous to the detection of light, sound or smell: if the light, sound or smell was intense enough, anyone with normal senses could detect it. We would expect the same to be true for electromagnetic signals. Experimental subjects could be placed in a suitably insulated room (for background light, sound or smell) and a test signal

could be emitted from behind their backs.

In parallel experiments, the intensity of an artificial extramission signal could be dialed down till the threshold for conscious detection in a test population was determined. Presumably, there would be a bell-shaped curve for the distribution of detection thresholds in a normal population sample. One would then compare the detection threshold to the amplitude of the human ocular extramission wave. If the sense of being stared at is sometimes real, then the amplitude of the extramission signal must usually be below threshold, otherwise we would detect the signal all the time. It cannot be so far below threshold that it is never detected, however. Either the intensity of the signal, the threshold, or both must fluctuate so that the signal is detected on occasion.

Once all these experiments had been completed, it would be interesting to study whether extramission signal detection performance can improve with training. This would be of military interest. Troops could be trained to detect the gaze of an enemy combatant, and snipers could be trained not to stare too intently at the target.

Also, in principle, it should be possible to construct a switch activated by staring at it. As long as the detector can tell the difference between the general signal emerging from the person, and the ocular extramission signal, then with suitable software one has an on-off switch. This would be analogous to a clapper light activated by the sound waves created by clapping your hands, except that the signal is ocular extramission[1]. Such a device could be used to turn any electrical device on, off, up or down, from garage door openers to computers to household appliances to alarm systems for quadriplegics.

If such technology ever enters the market place, it will do so because there is a kernel of truth in evil eye beliefs.

The Quantitative EEG Waveform of Human Ocular Extramission

I have demonstrated that elements (1) and (2) of the theory of extramission are scientifically correct, using a high-impedance non-contact electrode placed two centimeters in front of the eye inside electromagnetically insulated goggles. I am doubtful that element (3) is correct, but it is possible that there is some sort of EM back-signal from objects gazed upon that contributes to visual perception, and acts as a type of subliminal EM radar. Setting that possibility aside, the following experiment

1. I have registred this technology with U.S. Patent 7,806,527.

establishes that extramission is real (Ross, 2009; 2010b). This means that there is a scientifically specified mechanism for the sense of being stared at that can be studied experimentally.

TECHNICAL SET UP OF THE EXPERIMENT (PLANNAR ARRAY):

The high-impedance electrode used in the experiment is described in Ross (2010b; in press). It consisted of a planar array fabricated using custom silicon-based printed circuit techniques. The multi-electrode array had a single 235 um shank, 15 um thick, with 64 sites arranged on the shank. The multi-electrode array was then bonded to a printed circuit board with a Samtec connecter. The 64 sites on the Samtec connector were then shorted with solder and attached to custom EEG cables, effectively making the multi-electrode array one single electrode of 64 distinct contacts with a collective site size of (64 x 177 μm2) = 11,328 μm^2. Impedance of the electrode in physiological saline was 30 kiloohms. Impedance of the electrode in air was not taken, but is assumed to be in the giga-ohm range.

The high-impedance electrode was placed on the inside of the right lens of a pair of goggles: the electrode was mounted such that it was about two centimeters in front of the right iris of the test subject, a 59-year old Caucasian male. In order to obtain sufficient electromagnetic insulation to be able to detect a signal, the right front lens of the goggles was covered with multiple layers of aluminum foil and copper wire mesh.

Data was collected utilizing 21 channels of a Deymed Truscan 32 channel clinical EEG system. An Electro-Cap, Lexicor surgical style cap was used for collection of 19 channels in a 10/20 electrode placement with a linked ears reference: these are standard locations for placement of electrodes on the scalp, plus reference electrodes attached to both ear lobes. The additional two channels, also with linked ears reference, were used for the goggle electrode and a free-hanging electrode placed approximately two centimeters in front of the goggles. The goggle electrode was located in front of the right eye below the standard forehead site, Fp2. The free hanging electrode was held in place by two cotton tip applicators that had been taped together and then taped to the top of the goggles, extending the elec-

2. I have registred this technology with U.S. Patent 7,806,527.

trode forward and hanging freely in front of the goggles. Data was collected for approximately 7.5 minutes in both eyes closed and eyes open, resting states. The goggle electrode is labeled POz and the free hanging electrode Fpz.

The EEG waveform of the human ocular extramission (POz), the control electrode hanging free in front of the goggles (Fpz), and the standard scalp leads, are shown in Figure 1. As can be seen in Figure 1, the ocular extramission waveform closely resembles two standard contact electrodes placed on the forehead at Fp1 and Fp2. The control electrode (Fpz) demonstrates only low amplitude, high frequency background noise plus the heart beat of the subject. The waveform proves that a physiologically active signal emerges through the eyes, in other words, human ocular extramission is a demonstrated scientific fact. The waveform also demonstrates that the signal interacts with objects in the outside world (otherwise it could not be detected by the electrode).

Whether this signal has an ecological function remains to be investigated. However, the electrophysiological reality underlying evil eye beliefs is now a testable scientific hypothesis. Evil eye belief is no longer purely a superstition, in terms of future scientific research.

Testing for the existence of human ocular extramission is a critical experiment in the science of human energy fields. If no waveform could be detected by the eye electrode, the external signaling components of the theory would be in jeopardy. It would still be possible that the controls for many internal regulatory processes are at the EM level, however. In one sense, this must be true since, within western science, all biochemistry reduces to quantum mechanical interactions between the electron clouds of atoms.

Additional applications of the theory of human energy fields in anthropology

There are a number of cultural beliefs and traditional practices that may provide clues to real underlying EM interactions between human beings and the outside world. Scientifically, there is no doubt that very weak EM signals from the distant reaches of the universe reach earth and interact with our bodies and other physical objects on the planet. If this was not true, we could not see the stars at night, nor could astrophysicists study gravity waves, dark matter, black holes, supernovae and the other phenomena of their science.

The question is not, "Do such signals exist?"

The question is, "Can such incredibly weak signals have any meaningful physiological effect?"

Before responding, "No," one should consider that the retina captures single photons in order to activate visual perception, receptors in the skin capture individual photons to synthesize vitamin D and melanin, plants capture single photons to synthesize chlorophyll, an astronaut on the moon can maintain radio communication with the earth, and the gravitational field of the moon controls the tides. All of these phenomena are based on extremely weak EM or gravitational signals. For example, the force of gravity is so weak compared to the magnetic field of a small magnet that the magnet wins a tug-of-war with the entire earth, and thereby picks up a paper clip.

Whether this physics has any meaningful role in human or general mammalian physiology remains to be determined, but it is not conceptually or scientifically impossible that very weak signals from outer space, the biosphere, and the earth affect us physiologically: the fact that they do is proven every time we look up at the night sky.

Fertility Rituals

Fertility rites and beliefs of various kinds are universal, from the myth of the Fisher King to the May Dance. Consider the shaman who sings a chant in order to stimulate the crops to germinate. He invokes the spirits as he does so, and sends his song up into the sky for Sky Father to hear, or down into the Earth, for the Earth Mother to hear. Let us assume that there is no such anthropomorphic sentient individual up in the sky or down on earth. What could be going on here?

We know that EM signals from the sun are essential for plant growth. Why not for seed germination? Could it be that the body of the shaman emits a focused EM signal that actually penetrates the soil and stimulates germination? How could belief in this ritual be turned into a testable scientific hypothesis?

The first step is to develop technology that can detect the EM field of the human body remotely. As I have mentioned above, this is already being done by electrical engineers in England who are taking an EKG from three feet away using a high-impedance electrode that makes no physical contact with the body (Harland, Clark, & Prance, 2002; Harland, Clark, & Prance, 2002; Prance, Beardsmore-Rust, Aydin, Harland, & Prance, 2008; Prance, Debray, Clark, Prance, Nock, Harland, & Clippingdale,

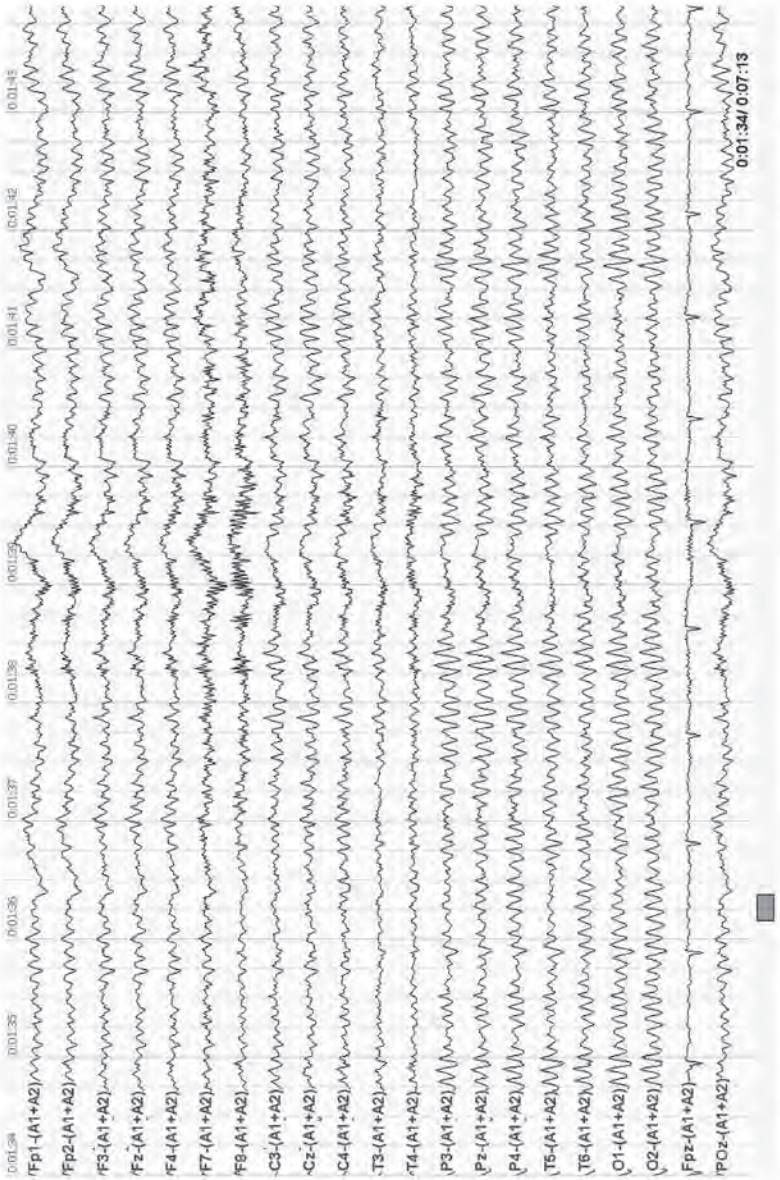

FIGURE 1. The Human Ocular Extramission Signal (POz)

2000). Using such technology, one would have to characterize the signal emanating from the shaman's body during a fertility ritual. Having done that, it would be necessary to construct a device that emits a similar EM signal. One could then test whether emissions from this device stimulate plant germination and growth in a hydroponic garden. If they can, potential applications in agriculture would follow, and the fertility rituals of the shaman would have been transformed into a useful technology. Spears and wheels may be "primitive," but they still work.

Remote Sensing of Game by Hunters

Ancient hunters, such as the Athapaskan Indians of North America, commonly believed that they could sense game remotely. They believed that the hunter's mental state, and that of women back at camp, affected the willingness of the game to be killed (Vanstone, 1974). Various amulets, rituals and practices were designed to increase the chances of success in the hunt. In contemporary industrialized societies this is generally regarded as superstition, but there could be a kernel of truth in the ancient world view.

It is a scientific fact that all physical bodies emit EM radiation. We know that such signals can travel billions of light years across the universe and then be consciously registered by human beings, and given names like Aldebaran or Vega. EM radiation in the extra-low frequency range (ELF) does not drop off significantly at distances of thousands of kilometers (Barr, Jones, & Rodger, 2000). This is the frequency range sampled by EEG machines. We know that the brain waves and heart EM emissions of mammals are propagated out into the environment for long distances. Once they can be measured at a distance of a meter, as they are by the electrical engineers in England, then it is simply a matter of increased detector and software sensitivity to detect them at kilometer distances.

According to the theory of human energy fields, human beings are biological cell phones. They emit and receive a wide range of different EM signals, as do all biological species. Rather than simply being background noise, these signals contain information that is processed and acted upon at an ecological level. Consider the appearance of Venus to the naked eye: it is a small bright spot in the night sky. Then look at it through a hobbyist's telescope: now it has phases just like the moon. The information was present in the environment before we looked through the telescope.

Scanning technology in military satellites can count individual human beings on the ground. It is perfectly possible that there are detectors in the mammalian epidermis or peripheral nervous system that can register signals from game animals. Nothing about this is scientifically implausible or impossible. The ability of the human eye to discriminate between complete darkness and very low levels of visible light is quite remarkable. Why could this not be true for other modes of EM signal detection?

To investigate this phenomenon scientifically, one would need to catalog the EM emission spectrum of a bear, say, and construct a detector that could sense the bear at a distance of two kilometers. Similar infra-red detection equipment is already used by the military in night vision goggles. Once equipment was available that could detect the bear at such distances, it would be possible to test the accuracy of an aboriginal hunter. A problem in such research would be trying to find suitable hunters who retain this skill, and who can practice it in an ecosystem with sufficiently low EM pollution levels.

Australian aborigine medicine men, "men of high degree," of the Kumbaingeri tribe claimed that they could detect the trace signature of individuals who had been in a location up to several days earlier (Elkin, 1994). According to mainstream science, this is impossible, therefore the claim is consigned to the category of superstition. But consider the fact that scientists take core samples of ice in the Antarctic to study temperature conditions thousands of years ago. We know that physical events leave measurable traces in the environment for long periods of time.

When a person stays in a location for a period of time, his or her EM field must penetrate the surrounding rocks, trees and soil. It must, for a scientific certainty, interact with the EM fields of these surrounding objects and alter their vibrational frequency, harmonics and so on. In principle, it should be possible to measure this change in EM state of the surrounding object for a period of time after departure of the individual.

Sacred Power Spots, Sacred Mountains and Volcanoes

From the viewpoint of mechanistic, reductionist science, there is no such thing as sacred places, other than in subjective terms. Beliefs that certain waterfalls, rocks such as Uluru in Australia, and certain trees or mountains hold sacred energy are purely superstitious. There is nothing there except the basic inanimate forces of physics, including fundamentally gravity, EM energy, and the strong and weak nuclear forces, to which all

things reduce. However, if the EM fields in the universe interact with and affect human beings, another perspective is possible.

We know for a fact that there are measurable variations in the local EM field due to surface rocks and underground geology. Such variability is measured during explorations for oil and gas deposits. Sedona, Arizona is a candidate location for a sacred site. We could measure the whole body EM field of an individual who had been in a large city for a prolonged period of time. This individual would then go to Sedona and spend two weeks hiking, meditating and sitting in the natural environment close to the beautiful red rock formations. During this two week period, the person's EM field will shift measurably to be attuned to the EM field of the rocks. Subjectively, this change will be experienced as increased grounding, psychological rootedness, peace and a sense of connection to the divine.

Indeed, related measurements have already been taken by Michael Persinger (Hill & Persinger, 2003; Persinger, 2002; 2003; 2004). He has already demonstrated that memory and other psychological functions of test subjects can be measurably altered by artificially applied EM fields. He has also demonstrated that a subjective sense of the mystical and the sacred is associated with local geological EM field variations, and can be induced artificially by applied EM fields.

Traditional beliefs about sacred sites and power spots may have a real electrophysiological basis. They may be a subjective language for real physics and for real alterations in the brain EM field induced by the external EM fields of the earth and biosphere. In addition to electrophysiological experiments, one could study the effect of such sacred site practices on social cohesion, group survival, and so on. The "illusion" might have very real social and anthropological consequences. Perhaps such "illusions" have public health benefits.

Belief in the Earth Mother

Revering the earth and the sun as alive, nurturing entities is generally regarded as a superstition in modern industrialized societies. Another scientific viewpoint is possible, however. According to the theory of human energy fields there are measurable health benefits from being connected to the main EM field of the earth, not to mention other sources of EM field variability including local geology, solar wind, and solar flares. These benefits occur at the EM level and may or may not trickle down to the biological level.

An example of an EM public health crisis in the United States is the current epidemic of vitamin D deficiency. Vitamin D is synthesized in the skin via exposure to sunlight. Due to a combination of poor diet, reduced sun exposure and increased sunscreen usage, 61% of children in the United States are deficient in vitamin D, with blood levels below 30ng/mL (Kumar, Muntner, Kaskel, Hallpern, & Melamed, 2009). Vitamin D interacts with over 200 different genes in the human genome and has pervasive functions and health benefits throughout the body (Ramagopalan, Heger, Berlanga, Maugeri, Lincoln, Burrell, Handunnetthi, Handel, Disanto, Orton, Watson, Morahan, Giovannoni, Ponting, Ebers, & Knight, 2010). We are currently in the midst of a scientifically proven EM field deficiency epidemic with measurable biological consequences. This is not likely to be the only EM epidemic from which we suffer in industrialized countries.

The theory of human energy fields postulates that there are measurable health benefits from being connected to the main EM field of the earth. Astronauts who spend prolonged periods at a space station develop some degree of bone loss, which is attributed to lack of gravity. This is an example of the general negative health effects of being disconnected from the Earth, gravitationally and electromagnetically. The degree of disconnection experienced in outer space is only an extreme form of the disconnection experienced in a modern urban environment. It may be a metaphor to call the earth Mother, but it may also be scientifically accurate. Much of our scientific language is metaphorical in any case: does RNA polymerase really read or transcribe DNA, literally? No, these are metaphors, but they are perfectly scientific.

Conclusions

The theory of human energy fields makes a range of scientifically testable predictions within anthropology. The basic idea is that traditional cultural beliefs and practices may contain clues to real electromagnetic (EM) field interactions in the biosphere. Rather than being mere background noise, the EM emissions of biological and non-biological objects contain information that has ecological functions. Examples of such beliefs and practices include the evil eye, remote sensing of game, sacred or power sites, fertility rituals and sensing of prior visitors to a camp site. The study of EM fields and traditional beliefs is a potential new area of anthropology that complements and extends current forms of cross-cultural study. The theory unites western science and a wide range of traditional

beliefs and practices. The fact that the theory is not supported by a body of scientific evidence is not a limitation: at this point in its development, the purpose of the theory is to stimulate thought and research that might not otherwise be undertaken.

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