BIOFIELD AND ELECTRIC BODY: BRIDGING ANCIENT KNOWLEDGE AND MODERN SCIENCE, CONTEXTUALIZING AND DEMYSTIFYING ENERGY MEDICINE.

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ABSTRACT: The multidimensionality of human beings has been known since ancient times and is currently being investigated by modern science, with a cross-cultural and interdisciplinary approach. The novel concept of biofield is gaining popularity, because it encompasses physical and non-physical fields that would regulate the development and functions of biological organisms, explaining many unsolved mysteries of life science. Theoretical models have been formulated to describe these fields and their impact on physical reality: While electromagnetic fields can be experimentally measured and are thus already recognized by mainstream academia, their role in life science appears to be more important than commonly believed. Subtler non-physical fields may also exist and their relation to the physical world should be investigated as well. Within this framework, therapeutic and diagnostic modalities, based on energy, find a new context of existence, because their mechanisms of action and efficacy can be studied scientifically. Understanding the human bioenergetic anatomy, and its interaction with the Earth and cosmic environment, can lead to significant advances in the way we approach healthcare. Extending the materialistic-reductionistic paradigm to a holistic one will provide a more integrated and accurate worldview of science, medicine, and life.

KEYWORDS: Biofield; Biofield science; Biofield healing; Subtle energy; Life force; Morphogenetic fields; Electric body; Electromedicine; Electropollution; Geocosmic fields

INTRODUCTION

The existence of subtle dimensions, underlying the physical world and shaping its development, was postulated by almost any ancient culture around the planet

(Dale, 2009; Goswami, 2011; Jain, Daubenmier, et al., 2015). Human beings themselves would be made up of subtle bodies, beyond the material one, which explicate various functions of the self and determine its state of health. Ancient spiritual doctrines describe layers of energy, which extend outside the material organism, are constituted by more refined and less quantifiable "substances," and correspond to subtler aspects of the self. In a novel model of medicine, all these layers should be addressed and integrated, to achieve complete healing.

Despite some differences among various subtle anatomies, conceived by geographically and philosophically distant cultures, there are also many similarities. For example, the Indians described five main levels of being, corresponding to specific vibrations – physical, vital, mental, supramental, and bliss bodies – which share similarities with the Tibetan, Mayan, Incan, Egyptian, African, and Jewish worldviews, as well as with those of other indigenous cultures. In some traditions, these levels of existence are further refined into additional bodies, which increase the complexity and intricacy of the human subtle-energy system, including more and more specific aspects of the self. The characteristics of the main subtle bodies, which form a nested hierarchy, follow:

- Physical: The physical body, made up of gross matter and energy, and perceivable through ordinary senses, is the only object of investigation in modern allopathic medicine. It is the "hardware" that makes representations of higher subtler bodies.
- Vital: The vital body contains the blueprints, or "software," for organ formation, development, and function, and thus orchestrates the biology of the physical body; it is also the seat of feelings, which are in fact felt at specific organs and apparatuses.
- Mental: The mental body encompasses the dimension of thought, being responsible for the meaning-making process of events, through analysis, labeling, and comparison with previous experiences. It gives meaning to the activities of the vital and physical bodies, and its representations are expressed by the brain.
- Supramental: The supramental body is the realm of laws and archetypes, which contextualize the functioning and shape the movements of the mental, vital, and physical bodies; it is also the seat of intuition, which is a creative, higher-order type of thought that surpasses ordinary reasoning and past programming.
- Bliss: The bliss body is the most limitless, formless, whole, and spiritual

> body, which transcends all others. In the bliss dimension, individuality is lost and the self merges with the Divine or Infinite Consciousness. This body corresponds to the ground of all being, which is consciousness in its suchness, and embraces all dimensions of existence.

This review article will focus on the physical and vital bodies, as well as on the interrelationship between the two, which is still very mysterious and controversial. These topics will be explored from multiple perspectives, including gross and subtle components, trying to create a framework for scientific progress in this field.

Based on ancient knowledge, frontier science has coined the expression *subtle energy* to refer to the alleged non-physical fluid or life force, still formally undiscovered, but hypothesized to underlie the physical Universe and shape its development (Tiller, 1993, 1995). This type or types of energy would be different from, but correlated with, those commonly accepted in conventional science. Including this energy in the investigative frame, tracing its origin, and understanding its interaction with or influence on the physical world, seems to be necessary to explain anomalous phenomena occurring in many fields of science. As American physicist Claude Swanson (2016) wisely wrote about subtle energy:

> It manifests in many ways. Usually a scientist examines only one aspect of it at a time. Therefore most scientists who investigate it only see a part of the picture. Their description is reminiscent of the fable of the six blind men and the elephant. One man felt its tail, and concluded it was a rope. Another felt its leg, and described it as a tree. A third felt its huge ear, and described it as a large leaf, while a fourth touched its side and described it as a wall. In the case of subtle energy, it alters the other physical laws in many different ways. It responds to and affects consciousness, and also modifies electricity, magnetism, gravity, time, even nuclear processes. It is a many-faceted phenomenon. Yet in most cases its effects are weak, so it keeps being discovered and forgotten over and over by many scientists throughout history! (pp. 49-50)

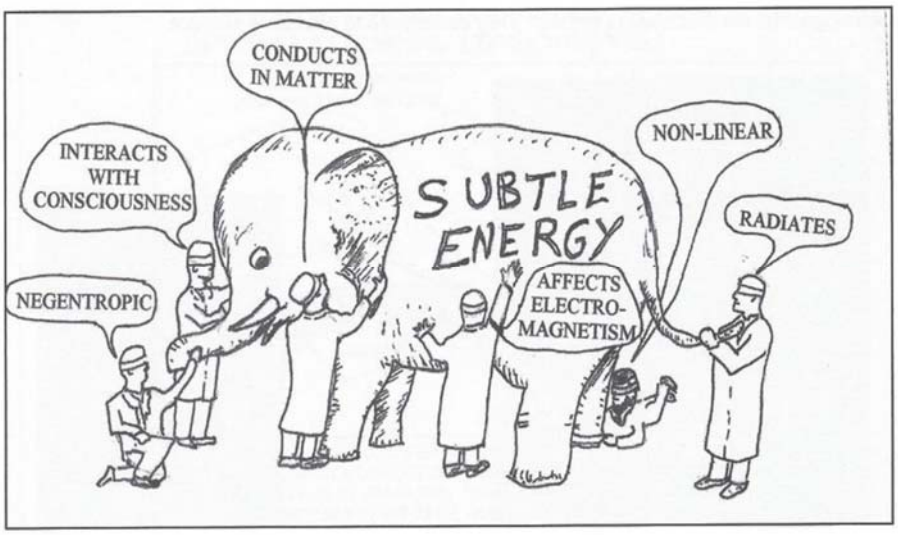

Figure 1: Subtle energy revisitation of *The Blind Men and the Elephant* Indian parable. Each man touches a different part of the elephant – i.e., discovers a certain aspect of subtle energy – but fails to identify the animal as a whole – i.e., cannot create a coherent scientific framework that unifies all manifestations of subtle energy. Picture retrieved from Swanson (2016, p. 50).

MORPHOGENESIS AND EVOLUTION

In modern times, the vital body has been theorized as a subtle organizing field, which structures living beings and guides their morphogenesis. At the beginning of the 20th century, Russian histologist and embryologist Alexander Gurwitsch developed a holistic biological-field theory, observing embryonic development and noticing that morphogenesis occurs in an integrated and coordinated manner (Beloussov, 2008; Beloussov et al., 1997). Based on empirical verification, the scientist hypothesized that a supra-cellular ordering factor, principle, or force field, determined the behavior of individual cells. Thus, he concluded that studying the whole could lead to more accurate results than focusing on the attributes of its parts.

In recent decades, Gurwitsch's work has been continued and expanded by English biologist Rupert Sheldrake, who created the theory of formative causation (Sheldrake, 2006, 2009, 2012): According to Sheldrake, invisible morphogenetic fields, containing the blueprints for biological development,

would inform and shape matter, leading it to its final structure and function. The end goal is called *attractor*, and represents the characteristic form or pattern of activity toward which a system is pulled, while the pathways to reach it are called *chreodes*. In this model, genes do play the important role of protein coding and synthesis, but they cannot explain the complexity of organism morphogenesis and lawful behavior; this is instead attributed to intelligent fields that regulate gene activity.

In Sheldrake's theory, morphogenetic fields are a subcategory of morphic fields, defined as self-organizing wholes, working at different levels of complexity, in a nested hierarchy. These fields would be inherited through morphic resonance, a kind of collective, instinctive, and non-local memory, based on similarity. Any living or non-living thing would spontaneously tune into its specific field, simultaneously informing it and being informed by it. Each member of a species or category would draw on and contribute to their common field, which would dynamically evolve, assuming new patterns of shape, function, and behavior. Such pooled memory would build up cumulatively and would not be attenuated by space or time distance: The more a particular form, process, or activity is repeated in similar systems, the more likely it will be inherited by future similar ones, becoming a habit, regardless of spatiotemporal constraints. A system would thus maintain its identity through self-resonance with its own past states, which more closely resemble its present ones.

Morphic fields would be probabilistic and non-energetic informational structures, i.e., they would not involve the transfer of energy but information, which would give a pattern to physical observables, depending on the influences from previous similar entities. However, the bioelectrical components of morphogenetic fields, i.e., the endogenous signals representing their physical embodiment, are currently being investigated for real applications in regenerative medicine (Levin, 2009, 2011, 2012). These interventions could be used to correct damages caused by birth defects, degenerative diseases, cancer, traumatic injuries, and aging.

Experimental evidence for the existence of morphic fields comes from many areas of science. For example, crystallization behavior appears to be influenced by the substance history (Woodard & McCrone, 1975): It has been reported worldwide that certain compounds, which struggle to crystallize, do it easier and

easier as the process is being repeated; while novel crystal structures spontaneously appear and become favored the more they occur, replacing the previous ones. This led some authors to comment, "Most interesting to us is the fact that once one laboratory has recrystallized a compound, either for the first time or in a more stable form, other laboratories were able to do so" (Woodard & McCrone, 1975, p. 342).

Moreover, the structure of crystals cannot be predicted with certainty based on their chemical composition, as if an additional form-giving factor should be included in theoretical models, which is currently not (Cruz-Cabeza, 2016; Dunitz & Scheraga, 2004; Narasimhan, 2020; Thakur et al., 2015). Reporting the vivid admission of an expert, still valid today, "One of the continuing scandals in the physical sciences is that it remains in general impossible to predict the structure of even the simplest crystalline solids from a knowledge of their chemical composition" (Maddox, 1988, p. 201).

Another example is protein folding, considered to be the most important process in biochemistry and biology, as well as the most mysterious (Clay Clark, 2008; Creighton, 1990; Dill & MacCallum, 2012; Dunitz & Scheraga, 2004; Janković & Polović, 2017; Moore et al., 2022). In fact, it is still unknown how proteins can fold, spontaneously choosing the correct structure to perform a certain function, out of an enormous amount of possibilities and in a tiny period of time. Besides, similarly to crystals, it is impossible to predict with certainty the structure of proteins based on their amino-acid composition. The National Institute of General Medical Sciences (2007) summarized this great unsolved problem of structural biology as follows: "for more than 50 years they've tried – and failed – to crack the code that governs folding" (p. 8).

Furthermore, the capability of some unicellular algae to grow entire structures, even when they are enucleated, indicates that morphogenesis can take place in the absence of genes; while mechanistic developmental models and biochemical explanations seem to be unsatisfactory to explain this phenomenon (Baltus et al., 1968; Spencer & Harris, 1964; Vanden Driessche et al., 1997).

Additionally, animal behavior – for example, nest building and cleaning, communication, and courtship – appears to involve species-specific, instinctive, and innate acts, articulated in fixed-action patterns; this supports the hypothesis that inherited regulatory fields guide species habits, while genetic or other

theories may not explain well the complexities of behavior (A. P. Smith, 1978; Brockelman & Schilling, 1984; Collias, 1964; Hinde & Harrison Matthews, 1958; Lorenz, 1958; Rothenbuhler, 1964). This is particularly evident in animal societies, such as bird flocks, fish schools, mammal herds, insect swarms and colonies, which seem to act as one, whole, interconnected organism (Cavagna et al., 2018; Couzin, 2009, 2018; Giardina, 2008): Their collective movements, synchronized activities, and coherent group responses challenge any mechanistic model and would be better described with a field theory.

Molecular biology is facing a deep crisis, also because the progress in genome sequencing cannot explain the multifaceted features of living beings nor the origin of diseases. Unexpectedly, the genome size can vary considerably among species, but it appears to be unrelated to organismal complexity or similarity (Eddy, 2012; Gregory, 2001, 2005; King & Wilson, 1975; Olson & Varki, 2004). For example, the genome of an amoeba is roughly 200 times larger than that of a human, who is biologically much more complex; the genetic distance between humans and chimpanzees is ~ 1%, which appears too small to account for their anatomical and behavioral differences; while angiosperm plants have a 1000-fold total variation in their DNA content, even though they are all closely related species – a solution to this paradox has been proposed, involving non-coding DNA, but the issue remains highly controversial.

Besides, attempts to find genes for every human disease have resoundingly failed, as only a limited number of health conditions can be genuinely traced back to genetics, while lifestyle and environmental factors have been systematically underestimated (Carter Miles, 2023; Latham, 2011; Manolio et al., 2009).

Furthermore, evidence of epigenetic changes and inheritance has scaled down genetic absolutism, in favor of subtler and more holistic models in biology, medicine, and life sciences (Alegría-Torres et al., 2011; Dennis, 2003; Handel et al., 2010; Jablonka & Lamb, 2015; Ospelt, 2022; Qiu, 2006; Villota-Salazar et al., 2016). In fact, studies have shown that phenotypic traits can be acquired from lifestyle and environmental influences, be genetically assimilated, and be passed down to subsequent generations (Anway et al., 2005; Fraga et al., 2005; Ho et al., 1983; Morgan et al., 1999; Sen et al., 2015; Waddington, 1953, 1956; Waterland & Jirtle, 2003). Additionally, how cellular differentiation and specialization take place in living systems is still unclear, and seems to be more easily understandable

through fields, which define positional information and coordinate pattern formation, rather than through molecules (Koch & Meinhardt, 1994; Vargesson, 2019; Y. Wang et al., 2020).

Finally, the most accepted theory of evolution, based on the survival of the fittest through the natural selection of the most useful genetic traits, was put to question since its initial formulation and even by its proponent. In fact, English naturalist, geologist, and biologist Charles Darwin (1859) admitted:

> To suppose that the eye, with all its inimitable contrivances for adjusting the focus to different distances, for admitting different amounts of light, and for the correction of spherical and chromatic aberration, could have been formed by natural selection, seems, I freely confess, absurd in the highest possible degree. … If it could be demonstrated that any complex organ existed, which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down. But I can find out no such case. No doubt many organs exist of which we do not know the transitional grades … Although we must be extremely cautious in concluding that any organ could not possibly have been produced by successive transitional gradations, yet, undoubtedly, grave cases of difficulty occur … (pp. 186-192)

Today, it has been proposed that *irreducibly complex* biological systems – where each of their composing parts is necessary and indispensable for the functioning of the whole system – are a fundamental feature of living organisms, starting from the very cells they are made of (Behe, 2004, 2006). Since all parts of an irreducibly complex system are matched and interactive with the others, the removal of any one of them would cause the entire system to stop working, completely not just partially. It is thus unclear how, for example, a human eye, ear, or heart, could have developed gradually in small steps, surviving natural selection, even though those systems were not functional until their final form.

Additionally, if evolution were driven by random genetic mutations, innumerable transitional forms should have existed for each species, being more or less compatible with the environment and thus more or less fit for survival. However, this countless number of variations has not been found among the fossil remains. This issue was raised even by Darwin (1859), who justified this evident contradiction with the imperfection of the geological record (Chapter IX), a thesis that was already questionable at the time and it is even more today. Animal instinct and behavior are also difficult to explain through Darwin's (1859) theory, since a step-by-step evolution would not have made them functional and life-

supporting from the initial stages (Chapter VII).

Therefore, many natural phenomena strongly suggest the presence of invisible fields, which regulate biological formation, function, behavior, and inheritance, providing explanations for the undeniable paradoxes and limitations of biomolecular science.

TORSION FIELDS AND PHYSICAL VACUUM

Another model to describe subtle energy was developed by Russian physicists Akimov and Shipov, who built on the work of Cartan and Kozyrev, revisiting torsion fields as waves that propagate through the physical vacuum and twist it (Akimov, 2004; Akimov & Shipov, 1997; Benford, 1999; Swanson, 2008). Based on their theoretical predictions and experimental results, they proposed that rotating objects create long-range torsion fields, which distort the vacuum: These waves would be able to travel faster than light, transmit information without transmitting energy, and penetrate through physical media without being screened, attenuated, or dissipated. The spin of subatomic particles would also be a source of torsion, thus any physical and biological entity would possess its own macroscopic field, with a configuration and intensity dependent on the overall spin pattern of its microscopic components.

Therefore, spin would generate a torsion field, and torsion would be a universal force, in the same way as electromagnetism and gravity are forces generated by electric charge and mass. Similarly to blueprints, spin patterns could be recorded, impressed, and transferred, affecting the structure, features, and behavior of living and non-living things. In this theory, vacuum distortion via torsion fields would allow to explain subtle energy healing and consciousness phenomena, which are otherwise unexplainable through conventional physical forces.

A similar model was proposed by American physicist William Tiller (1993), who traced the seat of subtle energy functioning to the vacuum, reinterpreting living systems as transducers that convert this undetectable energy into a physical observable. However, in science, the law of conservation of energy seems to hold so far, thus it is unclear how a physical system could be supplied with energy from non-physical dimensions, with that going unnoticed. Therefore, it is possible that subtle energy is actually a field of information, which organizes matter and

physical energy, without transferring or exchanging energy – its name thus being misleading.

It should be noted though that it is difficult to verify the law of conservation of energy in living systems, because of their extreme complexity and largely unknown functioning. For example, in human beings, an analysis of short-term calorimetric studies, based on thermal physiology, and long-term nutritional studies, based on food intake, waste, and tissue storage, returned unexpected results (Webb, 1980): A significant amount of unmeasured energy, whose origin is unclear, needs to be added to the equations of metabolic balance. This led the author of the analysis to conclude, "The more careful the study, the more clearly there is evidence of energy not accounted for" (Webb, 1980, p. 1300).

PHANTOM LEAVES AND LIMBS

The application of a high intensity and high frequency electric field (EF) on plants has led to the discovery of the *phantom leaf effect* (Hubacher, 2015): Partially cut leaves appear whole in the electrical discharge induced on their surface by the EF, revealing a usually invisible, electrically-conductive substratum, which persists after its material counterpart has been removed. Even when most of the leaf is cut away, the discharge image impressed on photographic film is integer, without amputation, and with the phantom section reproducing the precise anatomy of the physical one. Although this study is notoriously difficult to replicate, the results obtained so far seem to be interesting. The visualization of a normally undetected, coherent structure, permeating and supporting physical matter, corroborates the hypothesis of a subtle biological field.

A similar phenomenon is the *phantom limb pain*, which could be explored with the same electrical-discharge method (Leskowitz, 2014): Amputees experience painful sensations in their missing limb, suggesting that its subtle energy correlate is still present and "hurting." Among various therapies, subtle energy modalities, such as acupuncture, Therapeutic Touch, and energy psychology, may help to treat the symptoms of this condition, which responds poorly to allopathic medicine. This reveals that the human body and living beings are fundamentally energetic in nature.

BIOFIELD, HEALING, AND DEVICES

The term *biofield* describes a coherent energy-information field, both physical and metaphysical in nature, which supports biological activity by regulating the organism homeodynamics and coordinating its life functions (Hammerschlag et al., 2015; Kafatos et al., 2015; Rubik, 2002). The electromagnetic (EM) component of this endogenous, self-organizing, and highly-complex field would result from the superposition of all the ultra-weak electromagnetic fields (EMFs), emitted by any charged particle or ensemble of particles moving through the body. Biofield physiology is an emerging and promising discipline, aimed at investigating the energy processes within biological systems and their interrelation with biochemistry, through an encompassing and integrated approach.

In this novel, integrative biophysics, the materialistic and reductionistic framework, which is the foundation of mainstream science, is replaced by a holistic one: Materialism, the scientific and philosophical worldview, which claims that matter and its interactions are the only existing reality, and reductionism, which postulates that complex systems can be fully understood by reducing them to their simpler constituents, seem to be outdated assumptions. Conversely holism, the conception that a system should be viewed as a whole, and not interpreted as a mere collection of parts, seems to be more accurate: The properties of the whole cannot be fully explained by analyzing the behavior of its individual components, nor by computing their arithmetic sum; the entire system is instead greater than the sum of its parts and contributes to their characteristics, in a feedback loop.

This holistic and bioenergetic view of life, spirituality, and healing is in accordance with the Indo-Tibetan conception of human beings and health (Jain, Daubenmier, et al., 2015): An anatomy of grosser and subtler bodies would correspond to less or more refined manifestations of the all-pervading continuum of consciousness. Among these, the vital body would contain energy centers and pathways for the flow of subtle energy, whose balance or imbalance, fluidity or blockage, would determine the health status of the organism. Therefore, healing is interpreted as restoring the harmonious flow of subtle energy throughout the body. Biofield therapies from the East, such as meditation, yoga, tai chi, and qigong, would serve such purpose, by facilitating the harmonization of the human multidimensional anatomy, in order to enhance physical, mental, and

spiritual wellbeing. Through these techniques, the patient's biofield is manipulated and worked on to stimulate its natural healing responses.

A milestone in biofield science and healing was set in the 1990s, when a workshop of experts was held to expand the horizons of alternative medical systems and practices (National Institutes of Health, 1995). In the report, the word "biofield" was officially introduced, and biofield therapies from different countries were described, defined, and compared, allowing to formalize an area of investigation and application that seemed to be elusive, especially to scientists (pp. 134-146). The novel concept of biofield thus creates a valuable foundation for the scientific understanding of many complementary and alternative medicine (CAM) modalities, such as energy healing, acupuncture, homeopathy, and EM therapies (Beri, 2018; Jain, Hammerschlag, et al., 2015; Leskowitz, 2022; Liboff, 2007; Rindfleisch, 2010; Rubik, 2002): Through the biofield model, it is possible to provide a coherent explanation for the functioning of these therapies, whose efficacy is being tested clinically and appears to be promising, although methodological improvements are often necessary.

We live in an era where cardiovascular disease, diabetes, cancer, mental illness, and many other chronic conditions represent a major healthcare crisis, afflicting most of the Western population and draining enormous amounts of money (Jain, Ives, et al., 2015): The large-scale integration of efficacious and cost-effective therapeutic techniques, such as biofield modalities, into our medical system could make a tremendous contribution to the health of our society.

Given the popularity and efficacy of biofield healing modalities, a wide variety of technologies have been developed to assess or influence the biofield, through EMFs (light, heat, non-thermal), voltages, electric currents (ECs), sound, etc. (Muehsam et al., 2015). Some of these devices have been well studied over time and are commonly used in clinical settings, for example those based on electroencephalography (EEG) and electrocardiography (ECG); while others, whose functioning is still under investigation, have not yet been included in mainstream medical environments. The interest in biofield devices is growing concurrently with the body of evidence showing that energy organizes and modulates biological processes.

For example, it has been demonstrated that living beings emit and absorb ultra-weak coherent photons, which are exchanged within the organism to

regulate intercellular communication and life functions (Cohen & Popp, 1997; Fels, 2009; Popp & Klimek, 2007). Simultaneously, photon spectroscopy appears to be a promising tool for the detection of inflammatory and oxidative states, various diseases such as diabetes, hemiparesis, protoporphyria, and typical cold, as well as cerebral intention and relaxation (Ives et al., 2014; Zapata et al., 2021); while phototherapy appears to be an effective modality for pain relief, inflammation reduction, skin disease management and skin rejuvenation, wound healing, tissue regeneration, sleep improvement, neurological and psychological benefits, and for other purposes (Avci et al., 2013; Dompe et al., 2020; González-Muñoz et al., 2023; Gutiérrez-Menéndez et al., 2020; Hernández-Bule et al., 2024; Mansouri et al., 2020; Salehpour et al., 2018; van Maanen et al., 2016). Biophotons will be discussed further on in this review.

Heat can also be used as a diagnostic tool: Through infrared thermography, small changes in the body temperature can be detected, allowing to identify, from the very early stages, the development of inflammation and thus disease, including fever, breast cancer, diabetic neuropathy, vascular disorders, rheumatic diseases, and others; and it can also be useful for burn assessment, wound care, fracture screening, surgery, sports medicine, and neonatal monitoring (Faisal Abdulkareem & Qusai Hashim, 2024; Kesztyüs et al., 2023; Lahiri et al., 2012; Liu et al., 2025; Owen & Ramlakhan, 2017; Ramirez-GarciaLuna et al., 2022; Ring & Ammer, 2012; Szentkuti et al., 2011); while heat therapy and diathermy appear to be beneficial for cardiovascular and metabolic diseases (Brunt & Minson, 2021; Ely et al., 2017; Pizzey et al., 2021), primary dysmenorrhea (Jo & Lee, 2018), knee osteoarthritis (Laufer & Dar, 2012), musculoskeletal injuries (Giombini et al., 2007), pelvic floor disorders (González-Gutiérrez et al., 2022), orofacial pain (Amani et al., 2024), and other health conditions.

Furthermore, non-thermal EMFs, voltages, and ECs play an essential role in cellular, metabolic, and nervous functions, and have been utilized for medical purposes (Funk & Monsees, 2006; Glaser, 1992; Muehsam & Ventura, 2014; Ross et al., 2016; Tyler, 2017). The detection of endogenous electricity can return accurate information about the organism health status; while the application of exogenous electricity has proven to be successful in reducing pain and inflammation, stimulating wound healing, promoting bone and nerve regeneration, regulating cell behavior and gene expression, and for other

purposes. Electromedicine will be discussed further on in this review.

Sound, specifically ultrasound, is routinely used in hospitals for abdominal, cardiac, maternal, gynecological, urological, cerebrovascular examinations, etc. (Carovac et al., 2011; Wagai, 2007), as well as therapeutically for tendinitis, osteoarthritis, inflammation, pain, bone fractures, thrombosis, and also for angiogenesis, soft-tissue regeneration, neuromodulation, etc. (de Lucas et al., 2020; Jiang et al., 2019; Uddin et al., 2021); while sound healing, in the hearing range, appears to be beneficial to promote positive feelings, relaxation, and sleep, reduce stress, anxiety, depression, and mental disorders, relieve pain, modulate gene expression and physiological functions, and for other health-enhancing purposes (Kamioka et al., 2014; Kemper & Danhauer, 2005; Muehsam & Ventura, 2014; Mukand, 2024; Stegemann et al., 2019).

The variety of non-invasive biofield devices that can be used for diagnostic and therapeutic purposes continues to increase, representing a promising direction for medical science and business. However, the biochemical-pharmaceutical model of Western medicine challenges a paradigm shift toward bioenergetics and holistic medicine.

Historically, our healthcare system was defined and standardized in the United States, at the beginning of the 20th century, by the American Medical Association (AMA), with the support of the Carnegie and Rockefeller Foundations (Babker, 2023; Beck, 2004; Flexner, 1910; Johnson & Green, 2010; Stahnisch & Verhoef, 2012; Tripathy et al., 2024). In 1910, through the Flexner report, all CAM modalities, which did not seem to be profitable for a rising pharmaceutical industry, were marginalized. After the Flexner report, which established the allopathic medical model that we still have today, healing approaches such as naturopathy, homeopathy, chiropractic, osteopathy, electrotherapy, psychosomatic medicine, psychiatry, and other "eclectic" therapies were officially labeled as non-scientific; most CAM-oriented hospitals, colleges, and programs were closed; and funding started to concentrate on that education and research, which was aligned with the laboratory-based and bedside-oriented biomedical model. Nevertheless, interest in alternative medicine remained alive, including the study of biofields in human beings and the natural world.

ELECTRIC BODY

A new biophysical and medical science is emerging, and redefining living systems as energy systems, characterized by macroscopic quantum effects and interacting energetically with the external environment (Becker & Marino, 2010; Bischof, 2000; Burr & Northrop, 1935; Liboff, 2004; Rein, 2004; Rubik, 1995; Tiller, 1977). In fact, biological organization, development, and function cannot be fully explained through the reductionistic, classical-physics, and particle-centric approach of molecular biology, but they require a novel, holistic, and integrative viewpoint, based on quantum energy principles and fields. A purely mechanistic, bottom-up model of life, where genes and molecules are held responsible for every physiological process, as well as for the fields they generate, is limited and insufficient to account for the complexities of life: A vitalistic, top-down way should be included, to acknowledge the effects of energy fields on genes and molecules.

These fields would be EM in nature, but they may also have subtle components, belonging to pre-physical dimensions, which should be considered as well in order to formulate an adequate and integral theory of life. In this worldview, health and disease are understood in terms of the energy state of such fields, and healing is accomplished through their manipulation, modulation, and normalization. A new paradigm is necessary, where the body is parameterized as an interconnected network of quantum bioinformation and its state of health is determined by the type of data transferred within it.

Indeed, the body pulsates electricity (Helmreich, 2013; Jalil et al., 2015): EM waves prompt the heart to beat and neurons to fire, regulate biological processes, and can even radiate beyond the skin. While the interconnection of electricity with life and healing arts was known since ancient times, it was only in recent centuries that this empirical knowledge was scientifically discovered.

In the 18th-century Italy, physician, anatomist, and physicist Luigi Galvani found out that a flow of electricity through the nerves induces muscle contraction (Cambiaghi & Parent, 2018; Kipnis, 1987; Parent, 2004; Piccolino, 1998, 2006; Piccolino & Wade, 2012): He used the expressions *animal electricity* and *nerveo-electric fluid* to describe this intrinsic form of electricity, involved in nerve conduction and muscle movement. His controversial work was continued by his nephew, physicist Giovanni Aldini, who expanded Galvani's conclusions about the body electric fluid, pioneering the first medical applications. Later in the 19th century, physicist

Carlo Matteucci repeated and refined Galvani's experiments, proving the biological origin of the EC measured in muscles; while German physician, physiologist, and physicist Hermann von Helmholtz measured the speed of nerve signals, opening the way for a scientific understanding of the nervous system based on electricity.

With the newborn electrophysiology, a link among electricity, life, and medicine was established, in the view of scientists and academics, as well as writers and laypeople, which continued to be investigated throughout the 20th century: New discoveries, inventions, and instruments led to the development of innovative electrotherapeutic applications (Turrell, 1936).

In the 1920s, Russian histologist and embryologist Alexander Gurwitsch detected a very weak, ultraviolet light emitted by plant cells, which he called *mitogenetic radiation*, suspecting that it was involved in biological functions and triggered cell division (Bischof, 2005; Mould et al., 2024; Popp, 2003; Popp et al., 1992; R. van Wijk, 2001). With the improvement of technology and the development of sensitive photomultipliers, biological photon emission was further investigated: In the 1970s, German biophysicist Fritz Albert Popp coined the term *biophotons*, to describe the ultra-weak photons irradiated by living beings and ranging from the ultraviolet, through the visible, to the infrared band of the EM spectrum.

This radiation showed a high degree of coherence, therefore it did not appear to be caused exclusively by chlorophyll, thermal influence, spontaneous chemiluminescence, or some contamination effect. Popp formulated the hypothesis that biophotons are carriers of information that mediate cellular communication within biological systems, acting as a unified field that permeates, envelops, and regulates the whole organism. He theorized that biophotons are quantum-coherent or "squeezed" states of light, whose main source is the DNA in cell nuclei. The discovery of biophotons, and their relation to physiology and metabolism, opened new prospects for biological assessment in many fields of life science.

Like all living beings, humans emit biophotons, with differences that appear to be related to age, gender, biological rhythms, and health status, as well as state of consciousness (R. van Wijk & E. P. A. van Wijk, 2005). For example, studies on healers showed that their hand biophoton emission can be modulated by their

intention, suggesting that energy is directed by the mind (Creath & Schwartz, 2005; Rubik & Jabs, 2017). Similarly, it was found that focused intention, aimed at affecting physical reality, alters the brain biophoton emission in accordance with the result (Caswell et al., 2014). Moreover, meditation practice influences the organism biophoton emission, which demonstrates the interaction between mind and body (E. P. A. van Wijk et al., 2005; E. P. A. van Wijk, Lüdtke, & R. van Wijk, 2008; E. P. A. van Wijk, R. van Wijk, & Bajpai, 2008). Electricity thus appears to be intimately interwoven with life, inextricably linked to its functional activities, and deeply involved in its healing mechanisms.

ELECTROMEDICINE

Empirically, EM therapies have been used since ancient times, for a variety of health purposes. However, it was only with the formal discovery of electricity that this natural force started to be used medically in a controlled manner: Various devices have been invented, becoming popular among researchers and practitioners, for therapeutics and diagnostics, and continue to be tested to this day (Becker, 1990; Davis, 1992; Kirsch, 2006; Kshatriya et al., 2024; Mattsson & Simkó, 2019; Mayer et al., 2024; National Institutes of Health, 1995, pp. 45-65; Royal & Royal, 1991). Over time, applications have been developed to treat physical and mental conditions, such as pain, inflammation, wounds, bone fractures, osteoarthritis, stress-related disorders, spasms, paralysis, neurological conditions, and cancer.

Currently, reviews show the clinical efficacy or potential of electrotherapy to reduce inflammation (Ross & Harrison, 2015); accelerate wound (Rajendran et al., 2021; Thakral et al., 2013) and bone (Griffin & Bayat, 2011; McK. Ciombor & Aaron, 2005) healing; relieve musculoskeletal pain (Paolucci et al., 2020), such as fibromyalgia (Gilula, 2007), arthritis (Funk, 2018), and osteoarthritis (Cianni et al., 2024); improve the symptoms of diabetic peripheral neuropathy (Bairaktaridou et al., 2021) and vision (Sehic et al., 2016); promote motor recovery in individuals with spinal cord injury (Kanakis et al., 2024; Young, 2015) and functional locomotion in people with Parkinson's disease (Lee et al., 2019; Perestelo-Pérez et al., 2014); ameliorate epilepsy (Boon et al., 2009), anxiety (Ching et al., 2022), insomnia (L. Price et al., 2020), depression (L. Price et al., 2021), various psychiatric disorders (Elyamany et al., 2021), and other health

conditions.

Moreover, the pioneering work of American orthopedic surgeon and electrophysiology researcher Robert O. Becker, on electro-stimulating regeneration in living beings, has paved the way for novel approaches in regenerative medicine (Becker & Selden, 1998; Becker & Spadaro, 1972; Hunckler & de Mel, 2017; Lampe, 1998; Luo et al., 2021): Studies on humans, other mammals, and amphibians, in vitro and in vivo, have proven that electricity is capable of accelerating the closure of wounds and ulcers; inducing bone, soft tissue, nerve, and skin repair; and facilitating the partial or total regrowth of amputated limbs, depending on the species regenerative capacity. This process and its mechanisms are still under investigation; however, it seems that the artificial reproduction of endogenous bioelectrical signals promotes healing and regeneration, by mimicking and supporting the natural currents of injury of the organism.

A natural form of electrotherapy, involving barefoot contact with the earth and thus called *earthing*, has been shown to lower inflammation, which is the underlying cause of diseases (Oschman, 2007, 2009, 2011, 2023): It has been hypothesized that free electrons, which are abundant on the Earth's surface, would enter the body and recharge its living matrix, i.e., its molecular fabric and electrical reservoir. By replenishing the charge of this body-wide ground substance, processes of healing, regeneration, and repair would be stimulated throughout the organism. It is plausible that a contributing factor to chronic diseases, which are common in contemporary society and costly to healthcare systems, is the lack of interaction between the human body and the Earth's electricity, which seems to be essential for normal physiological functioning.

Electrons may thus be a vital nutrient, we are currently deficient in, because of insulating shoes, homes, and buildings that disconnect us from the ground; therefore, restoring the human-Earth connection may help to nourish the body and resolve many health problems of modernity. A possible explanation for the efficacy of earthing is that free electrons act as natural antioxidants, neutralizing the positively-charged free radicals, which are the hallmark of inflammation. Others have suggested that earthing positively influences the organism physiology and health, by regulating the electrical activity of the nervous systems (Sokal & Sokal, 2011).

Clinical studies have demonstrated the numerous benefits of the earthing technique for the prevention and treatment of chronic inflammatory and autoimmune diseases (Chevalier et al., 2012; Menigoz et al., 2020; Oschman et al., 2015; Sinatra et al., 2023). For example, earthing was effective in reducing blood viscosity (Chevalier et al., 2013) and hypertension (Teli et al., 2015); improving blood flow regulation (Chevalier, 2014) and heart rate variability (Chevalier & Sinatra, 2011); healing chronic diabetic wounds (Estiningtyas et al., 2024); reducing muscle soreness and damage (D. Brown et al., 2010; R. Brown at al., 2015); decreasing pain and stress, and enhancing mood and sleep (Chevalier, 2015; Chevalier & Mori, 2007; Chevalier et al., 2006; Ghaly & Teplitz, 2004); and supporting the overall health and quality of life of bodyworkers (Chevalier et al., 2018; Chevalier et al., 2019).

Reviews show that the application of electricity to assess diseases, known as electrodiagnosis, can be a valuable means to identify, characterize, and manage peripheral nerve pathologies (Choi & di Maria, 2021; Dy et al., 2021; Ginsberg et al., 2020), such as carpal tunnel syndrome (L. Wang, 2013; MacDermid & Doherty, 2004; Osiak et al., 2021; Werner & Andary, 2011), ulnar neuropathy (Landau & Campbell, 2013), and other mononeuropathies (Patel & Horak, 2021); Guillain-Barré syndrome (Yoon et al., 2020); radiculopathies (Marquardt & Levin, 2021); traumatic brachial plexopathies (Mansukhani, 2013); cervical spinal cord injury (Berger et al., 2022); lumbar spinal stenosis (Kishner et al., 2010); motor neuron disease (Chad, 2002); myotonic disorders (Hehir & Logigian, 2013) and other myopathies (Paganoni & Amato, 2013).

Electricity is being widely used in clinical settings, and appears to be a powerful tool to promote psychophysical healing and wellbeing. However, if improperly used, it can cause serious health dangers.

ELECTROPOLLUTION

In recent decades, the dangerous effects of EMFs on biological systems have become a topic of interest, because of the complex network of artificial radiations we are exposed to, in our more and more technological society (Becker, 1990; Becker & Marino, 2010; BioInitiative Working Group et al., 2012; Clements-Croome, 2004; Levitt & Lai, 2010; McCredden et al., 2022; Oyedum et al., 2024). Electrical appliances, mobile phones, computers, and security devices are used

on a daily basis by the majority of the population in the industrialized world, and can be found in homes, offices, schools, hospitals, and public places. However, their impact on human psychophysical health has been poorly investigated, before releasing these technologies on the market.

Electropollution is definitely a controversial issue, because of the massive economic interests behind it and the industries' efforts to cover it up. The main question is whether even low-intensity and low-frequency EMFs are harmful to living beings. Despite the reassuring replies from tech companies and government agencies, independent studies are showing that these types of radiations, even though non-thermal and non-ionizing, pose a serious threat to living beings, causing adverse health effects in the short and long term.

Human, animal, and microbiological research, as well as epidemiological studies, have been conducted to assess the impact of EMFs of various frequencies and intensities on physiology, with alarming results. For example, it was found that EMFs can alter heart and blood parameters (Abdolmaleki et al., 2012; Al-Faqeeh et al., 2015; Parizek et al., 2023); affect brain glucose metabolism (Volkow et al., 2011); damage brain neurons (Salford et al., 2003); increase the incidence of brain and heart tumors (Falcioni et al., 2018); suppress melatonin production (Burch et al., 2000); decrease male fertility (Kumar et al., 2014; Pandey et al., 2016; Žaja et al., 2024) and female reproductive capacity (Panagopoulos et al., 2010); and, depending on the frequency, stimulate the growth rate, metabolic activity, and antibiotic resistance of pathogenic bacteria (Biswas et al., 2017; Said-Salman et al., 2019; Taheri et al., 2017).

Moreover, the literature shows that EMFs can disrupt endocrine and cellular function (Sellman, 2007); increase the risk of childhood leukemia (Seomun et al., 2021); and trigger epigenetic modifications in children, which contribute to neurodevelopmental and neurobehavioral dysfunctions, such as retarded memory, learning, cognition, and attention, behavioral disorders, and autism (Ahuja et al., 2013; Sage & Burgio, 2017).

Furthermore, a new syndrome, called *electromagnetic hypersensitivity*, is on the rise (Belpomme & Irigaray, 2022; Genuis & Lipp, 2012; Hedendahl et al., 2015): The most common symptoms are fatigue, headaches, dizziness, concentration and memory difficulties, sleep disturbances, nausea, skin problems, heart arrhythmias, muscle and joint ache, etc., experienced even by subjects who are exposed to standard EMFs in everyday places. Most people are unaware of this

disease and do not know how many fields surround them, because they cannot perceive them. Children appear to be particularly vulnerable, compared with adults (Kheifets et al., 2005). In fact, their developing nervous system is more sensitive, their brain tissue is more conductive, their energy absorption in the head is greater, and they will have a longer lifetime of exposure. The effect of external EMFs on our species health can be extended to include geocosmic space.

GEOCOSMIC FIELDS

Human beings are not isolated entities, dissociated from the Earth and the Universe, but open systems, constantly exchanging information and interacting with the external environment (Playfair & Hill, 1979). EMFs constitute the web of life that regulates and organizes the Earth's biosphere, which is in turn affected by the cosmic energy network. Viewing the Universe as a fractal whole, human beings stand as microcosmos immersed in the macrocosm, i.e., as small energy fields nested within larger fields, which can have a profound influence on their psychophysical wellbeing.

The Earth is a gigantic capacitor: In between its oppositely charged surface (negative) and ionosphere (positive), EM signals, called Schumann resonances, peak at around 7.8, 14.1, 20.3, 26.4, 32.5 Hz, etc. Human cerebral activity shows real-time coherence with the Schumann frequencies, at least within the first three harmonics, suggesting an interconnection and potentially an exchange of information between the brain and the Earth's EMF (Persinger & Saroka, 2015; Saroka & Persinger, 2014; Saroka et al., 2016). Interestingly, the literature shows that acupuncture points also resonate with electrical stimuli in the Schumann frequency range, confirming the energetic bond between body and Earth (Ćosić et al., 2006). Moreover, studies report a correlation between geomagnetic activity and cardiovascular parameters, such as heart rate variability and arterial blood pressure, supporting the conclusion that human physiology is linked to the Earth's EM environment (Al Abdulgader et al., 2018; McCraty et al., 2017; Nasutavičienė et al., 2019).

In many ways, living beings are spontaneously in tune with the Earth's energy field, or biofield, to which they are synchronized, having evolved and lived on this planet (C. Price et al., 2021; Erdmann et al., 2021; Hunting et al., 2021;

Panagopoulos, 2013): The electrical spectrum of various species often reproduces, interacts, and merges with that of the Earth, revealing unexpected forms of association and coupling, which are as much intriguing as complex to study. Importantly, the disruption of this delicate balance, due not only to human-made electropollution but also to natural causes, can produce serious psychobiological consequences.

For example, human health can be adversely conditioned by the Earth's biofield at specific locations, called *geopathic stress zones*, which can be found under buildings, roads, or natural places (Sorate et al., 2012; Sorate et al., 2014; Tong & Kong, 2021). This phenomenon appears to be caused by a distorted EM environment, which can be due to underground water streams, certain mineral concentrations, geological fault lines and cavities, human-made constructions, or the Earth's magnetic field. Symptoms include disturbed sleep, low energy, irritability, increased reaction time, changes in skin resistance, heart and pulse rate, blood pressure, and also asthma, arthritis, heart diseases, cancer, etc.; soil and plant properties are affected as well, and abnormal animal behavior and machine breakdown are also reported. The identification and avoidance of these zones, for living and transiting, seems to be important to protect public health, as commonly practiced in ancient times, because they may increase the occurrence of diseases and accidents.

Furthermore, a substantial body of scientific research shows that geomagnetic storms or variations are correlated with an increase in psychophysiological dysfunctions, especially in the cardiovascular and autonomic nervous systems (Zenchenko & Breus, 2021). The impact on the cardiovascular system appears to be particularly evident, with an increase in the incidence of myocardial infarctions and strokes during geomagnetic disturbances (Cornélissen et al., 2002).

A possible explanation for these unexpected correlations has been proposed, involving the effect of the geomagnetic field on brain waves (Cherry, 2002): When geomagnetic activity becomes extreme, so do Schumann waves, which resonantly interact with the brain, alter brain wave patterns, and induce a reduction in melatonin levels, affecting the organism homeostasis. In fact, the suppression of melatonin, a hormone secreted by the pineal gland, impacts on circadian rhythms, the cardiovascular and nervous systems, the immune,

endocrine, and reproductive systems, as well as on other apparatuses and functions, negatively influencing the organism physiology and health. Therefore, this biophysical mechanism would explain the biological effects observed in humans and other species during anomalous geomagnetic activity.

Others found this hypothesis promising but still incomplete, indicated that more research is necessary to define the details of this potential mechanism, and suggested that multiple mechanisms may be involved in these phenomena (Palmer et al., 2006). The interaction between Schumann resonances and human body continues to be studied, with an interdisciplinary approach, because it appears to have an important influence on human health and the development of diseases (Nevoit et al., 2025).

The activity of the Sun also appears to have an impact on human beings, which can be understood in terms of fields acting on fields: Our star goes through different phases of activity related to sunspots, which are temporary dark regions on the Sun's surface, periodically varying in number with a frequency of approximately 11 years. Maxima in sunspot number are accompanied by increased solar flux and storms, which disturb the Earth's biofield and consequently the Earthlings', producing adverse biological effects.

Decade-long studies have concluded that maxima in sunspot number are strongly correlated with an increased incidence of infections, pre-cancer, and cancer (Hrushesky et al., 2011), mortality from cancer, cardiac and neurological diseases, as well as with overall death rate (Cherry, 2003). Moreover, it was found that the lifespan of individuals born in a period of solar maximum tends to be shorter than that of individuals born in a period of solar minimum (Skjærvø et al., 2015); for some, the fertility and lifetime reproductive success also tend to be reduced. A possible biochemical explanation for this effect may be folate degradation during pregnancy, caused by ultraviolet radiation, which may determine long-term health consequences for the newborn; however, this hypothesis remains speculative. Many events from different contexts appear to be influenced by the solar cycle, occurring in relation to its phases: from the incidence of giant cell arteritis and rheumatoid arthritis (Wing et al., 2015), to economic recessions and political revolutions (Gorbanev, 2015).

The correlations between cosmic activity and living beings also include the Moon. Traditionally, an association between the Moon and human/animal

psychobiological behavior has always been noticed. Recently, scientific evidence has shown that the lunar cycle has an impact on human physiological and psychological processes, such as fertility, menstruation, and birth rate, hospital admissions, traffic accidents, crimes, and suicides (Zimecki, 2006); however, some of these findings are controversial. Animals are also affected, with changes in the endocrine and immune systems, especially in melatonin levels.

A study investigated the relation between lunar cycle and human sleep, concluding that self-reported sleep duration varied with the lunar cycle, with a minimum at full moon and a maximum at new moon (Röösli et al., 2006); there was also evidence of more tiredness in the morning after full moon nights. Other researchers added to these findings discovering that, around full moon, EEG-assessed sleep duration and deep sleep decreased, melatonin levels diminished, and overall sleep structure and subjective sleep quality worsened (Cajochen et al., 2013). A reduction in total sleep time around full moon was also found by others (Chaput et al., 2016; M. Smith et al., 2014). This may be the reason why an increase in general practice consultations tends to occur some days after a full moon (Neal & Colledge, 2000).

Furthermore, lunar phases have been shown to influence the physical activity and consequently the health of children (Sjödin et al., 2015), the clinical outcome of cardiovascular surgery (Shuhaiber et al., 2013), and suicide attempts (Seyhan et al., 2019). Gravitational fields do not seem to be adequate candidates to explain these phenomena, while EM and potentially subtler fields may be plausible mediators of these effects, which also involve human consciousness.

Some adventurous researchers applied a specific magnetic field to the brain of a naive volunteer (Saroka et al., 2010): The subject had an out-of-body experience, which was experimentally detected as an increase in interhemispheric coherence. He reported a feeling of lightness, which then became a sense of floating, as if his consciousness had detached from his body: "my body was oscillating around the place in the chair like a pendulum oscillating around its resting point even though I knew my body was sitting" (Saroka et al., 2010, p. 471). Unfortunately, the experience continued with rushes of anxiety, sensations of falling, feelings of dissociation from the body, loss of body image and awareness, and ended with fatigue and headache.

Moreover, in the fields of Sedona (AZ), famous for their geophysical

anomalies, some scientists were able to correlate natural variations in the Earth's EMF with spontaneous changes in the brainwaves of volunteers (Miller & Lonetree, 2013); this may explain the psychophysiological effects and altered states of consciousness, which are often reported in that location. EM energy appears to be intimately related to the functioning of the human body and mind, which can open fascinating prospects for individuals and communities.

In fact, it has been demonstrated that a coherent state of the heart EM rhythm, specifically a harmonic heart rate variability, leads to enhanced psychophysical balance and wellbeing, and consequently to increased social cohesion and cooperation (McCraty, 2017; McCraty & Childre, 2010; McCraty & Zayas, 2014; McCraty et al., 2009). Numerous experiments showed that, through emotional regulation techniques and biofeedback devices, it is possible to induce and assess positive states of being, which promote beneficial behaviors.

In a forward-thinking scenario, by harmonizing and synchronizing the biofields of a large number of people, the Earth's biofield will be positively modulated as well, since they are all interrelated and constantly interacting; this change will be reflected again in humans, in a feedback loop (McCraty & Al Abdulgader, 2021; McCraty et al., 2012). To support this claim, a network of ultrasensitive magnetometers has been installed around the planet and continuously measures the Earth's EMF, which is then correlated with human health, cognitive functions, emotions, and behavior, on a global scale. Results appear to be promising, confirm the energetic essence of human beings and the Earth, and reveal their deep interconnection.

CONCLUSIONS

Human beings seem to behave more as energy biocomputers than molecular machines. As Oriental traditions have passed down for millennia, the human body possesses an invisible and intangible energy system, underneath the visible and tangible material one, the two being different in nature but complementary in function.

Today, the biological field, or biofield, is being investigated scientifically in all its complexity, so that the generation, maintenance, and regulation mechanisms of living systems can be understood, beyond the "life as chemistry" paradigm (Rosch, 2009; Rubik et al., 2015). Within the biofield concept, ancient Eastern

knowledge and modern Western science are bridged and unified into an expanded, integrative medical model, which includes energy medicine. The biofield is becoming the new language of life.

Currently, biofield science lies outside the boundaries of conventional scientific inquiry, with poor acceptance by the medical and academic community. This is due in part to technical limitations of biofield studies, which often lack a rigorous design and statistical analysis, reliability and reproducibility of the outcomes, and independent replication (Gronowicz et al., 2015); however, it is also due to preconceived ideological biases and prejudices against unfamiliar concepts, which cause resistance and misunderstanding (Hufford et al., 2015). Addressing these issues involves a variety of collaborative efforts, including the establishment of professional education, certification programs, uniform training, and accredited schools, and the creation of standardized protocols for research and practice (Guarneri & King, 2015).

The very nature of the biofield needs to be systematically characterized, including EM and subtler components, and developing theoretical models that can predict, confirm, and explain experimental findings. In this way, healing modalities and screening technologies can become more effective in their functioning and more understandable to the public, whose interest in the topic is growing. In fact, biofield therapies such as Reiki, Pranic Healing, Therapeutic Touch, Healing Touch, qigong, and others, are a fundamental part of CAM; they are increasingly used by the general and clinical population; and they appear to be particularly successful in reducing pain, anxiety, and stress, and in promoting psychophysical health and wellbeing; however, further research, conducted with robust methodologies and explaining the underlying mechanisms, is necessary to validate these modalities and increase their acceptance in mainstream medical environments (Jain & Mills, 2010; Mangione et al., 2017; Matos et al., 2021; Movaffaghi & Farsi, 2009; Sprengel et al., 2025).

Certainly, EM fields play an important role in the prevention and treatment of chronic diseases, and could help to resolve a major problem in our healthcare system (Mintser et al., 2019; Mintser et al., 2020). Through a variegated range of devices, an electric body is being discovered, interpenetrating the chemical one and buzzing with EM activity, which can be assessed and regulated. It is the dawn of "Homo Electromagneticus" (Playfair & Hill, 1979, p. 69).

New frontiers of science are thus merging medicine with physics, and reinterpreting the human body as an interconnected, self-organizing system, based on quantum-electronic processes, which unfold in an intricate matrix of information (Curtis & Hurtak, 2004; Rubik, 2015). Biochemistry is being integrated with bioenergetics and the physical concept of field is being applied to biology, allowing to explore new modes of energy transmission, communication, and exchange within the body. The mechanistic medical model, based on classical physics, is becoming outdated: In this innovative, holistic vision of health, energy medicine finds its context, explanation, and validity, being demystified.

A shift in perspective is occurring in science, from a static and particle-oriented paradigm to a dynamic and field-oriented model. In this wavy view of life, human beings are powered by energy fields: Pharmacological remedies are integrated with EM waves, genetic determinism with quantum possibilities, and gross reductionism with subtle holism. The mastery of this knowledge should revolutionize the way we approach healing, with CAM modalities being widely practiced and recognized. This enhanced awareness should also open us to understanding our geocosmic environment, which influences our psychophysical wellbeing, as well as prevent us from destabilizing it with human-made EMFs, whose effects on living beings appear to be harmful.

Finally, as we delve deeper into this invisible reality, we may discover subtler and subtler fields, which lie at the foundation of the physical realm, shaping its existence and becoming. Consciousness may be the subtlest field, purest essence, and highest level of being, which encompasses and gives rise to all reality.

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