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Research Report

A Technology for Protection from Environmental Electromagnetic Fields

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Abstract Cellular telephones, Wi-Fi, and electricity have revolutionized our communications and lifestyles. Wireless technologies have become one of the fastest growing industries, with billions of users around the world. While many of us enjoy and depend on these modern conveniences, an increasing number of people are becoming sensitive or allergic to the electromagnetic fields used to operate our modern technologies. Research in this area indicates that those who have no observable ill effects may still be compromised at a subtle level. Sensitive individuals may have one or more ailments, such as stomach aches, headaches, muscle pains, poor sleep, or “mystery symptoms” that are difficult to diagnose and treat because few physicians are familiar with the real cause. The growth of coverage of Wi Fi will probably increase rather than slow, so it is essential that people be able to protect themselves. Many devices are available that claim to protect against electromagnetic pollution. One of the most thoroughly tested is the PRANAN family of devices. Various laboratory tests have documented the effectiveness of these systems in stabilizing various physiological processes. This article explores the possible mechanisms by which these effects are achieved. The surfaces of the devices have interesting geometrical patterns corresponding to ancient images found throughout nature, art and architecture. The well-known mathematics behind the symbols is referred to as the Golden ratio, Golden mean, Golden section, or Phi. Some of the greatest mathematical minds of all ages have spent endless hours contemplating this simple ratio and its properties. Biologists, artists, musicians, historians, architects, psychologists, and even mystics have pondered and debated the basis of its ubiquity and appeal. Because of the well-documented physiological effects of the PRANAN devices, we explore the possibility that the geometrical patterns on the surfaces of the devices reveal physical relationships between the geometry of electromagnetic fields in space (the quantum vacuum) and living tissues. This concept, remarkable is it may seem, is supported by recent developments in quantum physics that have demonstrated the underlying mathematics of Phi in relation to magnetic fields.

Keywords *electromagnetic pollution; electromagnetic sensitivity; electrosmog; Golden ratio, Phi*

1. Introduction

Cellular telephones and Wi-Fi have revolutionized our communications, and given rise to one of the fastest growing industries, with literally billions of users around the world. Manufacturers of wireless devices are striving to enable them to operate virtually any place on Earth. This has involved erecting many cellular towers and creating Wi-Fi “hotspots” to improve services for customers. There are even orbiting satellites that send and receive cellular phone signals (Satphones). These are popular on

expeditions into remote areas where terrestrial cellular service is unreliable. Likewise household electricity has brought many comforts. This has involved erecting networks of power lines and wiring systems that electrify our homes and offices.

While many of us enjoy and depend on these modern conveniences, for sensitive individuals there is an alarming and invisible price to pay. An increasing number of people are becoming sensitive or allergic to the electromagnetic fields used to operate our modern technologies, such as cellular and hand-held phones, mobile base stations, laptop computers, radars, ultrasonic dental scaling devices, MRI, etc. These individuals may have one or several ailments, such as stomach aches, headaches, muscle pains, poor sleep, or “mystery symptoms” that are difficult to diagnose and treat because few physicians are familiar with the real cause. While many people have no observable ill effects, their health may still be affected at a subtle level. Hypersensitive individuals are challenging for the physician because treating the symptoms does not work and prescribed drugs often have side-effects that can make matters worse. When the frustrated patient returns to the clinic, the doctor often recommends psychotherapy, but these unfortunate patients are not psychotic.

Some physicians are aware of electromagnetic sensitivity syndromes and have developed ways of treating them. Many of them are in a relatively new medical field called Environmental Medicine. They have formed an international association called the American Academy of Environmental Medicine (AAEM). Founded in 1965 as a non-profit medical association, the AAEM is composed of physicians and scientists who study and treat the effects of the environment on human health. The Academy has published a series of “position papers” describing the harms being done by environmental electromagnetic fields and the urgent steps needed to reduce the dangers, such as revising safety standards. From one of their statements: “It became clear to AAEM physicians that by the mid 1990’s patients were experiencing adverse health reactions and disease as a result of exposure to electromagnetic fields. In the last five years with the advent of wireless devices, there has been an exponential increase in the number of patients with radiofrequency induced disease and hypersensitivity [1].”

2. Discussion

For a long time, the science of biological effects of electromagnetic fields was dominated by the simple but incorrect idea that energy fields could not have biological effects unless the radiation was either ionizing or strong enough to heat tissues. Physicists could use physical laws to calculate the temperature changes induced in the human body by a particular energy field at a particular distance from a source, such as a cell phone tower or high-voltage powerline. These calculations were used to establish government exposure standards in order to protect people from harmful fields. Manufacturers of electromagnetic systems such as cellular phones, Wi Fi, and overhead power lines were able to “prove” that their technology was safe because the levels of energy they emitted were well within the limits established by government regulations. Moreover, a range of subtle healing technologies were declared to be useless because they did not produce enough energy to affect living tissues in any way.

The scientific basis for this perspective shifted dramatically in 1977 when scientists from the prestigious Neuroscience Research Program documented solid evidence for biological effects of extremely weak electromagnetic fields, far below the thermal limits [2]. However, the concept that tissues had to be heated or ionized to produce biological effects had been repeated so many times that the 1977 disclosure did not change attitudes. It was easy to maintain the wrong perspective because it supported the burgeoning cellular communication industry and because there was no known mechanism to explain the effects of extremely weak fields.

The perspective had to be revised in 2013 when Dr. Martin L. Pall explained precisely how minute fields interact with cells to produce beneficial or harmful effects [3]. Pall's extremely important study explains how very tiny fields in the environment, such as those from a distant cell telephone tower or Wi Fi or overhead power line can alter the physiology of the human body by influencing regulatory processes at the cellular level. Specifically, evidence from a number of studies points to the fact that minute electromagnetic fields can affect the voltage-gated calcium channels that regulate a wide range of cellular processes. These effects are usually virtually instantaneous. It appears that external fields can introduce chaos into delicate electromagnetic regulatory networks within the body and thereby produce a wide variety of symptoms, some of which are unusual and mysterious.

Physiological regulations are extremely important because virtually all diseases arise because of disturbances in the body's regulatory processes. The various ailments experienced by electromagnetically sensitive people, such as those mentioned above, are difficult to diagnose and treat because they are caused by regulatory disturbances, some of which are poorly understood. Dr. Pall and many others have made well-documented pleas for long-over-due revisions of the safety standards for electromagnetic field exposure, which are far out of step with the modern science [4]. We shall see that Pall's work helps explain how using the PRANAN devices can alter environmental energy fields that can affect every cell in the body.

In some countries, such as Sweden, electro-sensitivity has become a fully recognized disability. Epidemiological studies have shown that wireless communication networks are causing significant illness throughout society. Increased rates of asthma and even certain types of cancer and other diseases have been strongly correlated with exposure to radio broadcasting and Wi-Fi. Many people who worked in the electronics industry in Sweden, including an estimated 12% of the electrical engineers in that industry, became electrically sensitive, and helped form an organization called Föreningen för el-och bildskärmsskadade (Association for the Electrosensitive), or FEB. Due in part to the work of FEB and the research of Dr. Olle Johansson from the Karolinska Institutet in Stockholm, electrosensitivity is now a legally recognized disability in Sweden [5]. "The world may be moving inexorably," Johansson warns, "toward one of those tragic moments that will lead historians to ask: 'Why did they not act in time?'"

On September 23, 1998, 66 satellites, launched into low orbit by the Iridium Corporation, commenced broadcasting to the first ever satellite telephones. Those phones would work equally as well in mid-ocean, and in Antarctica, as in the middle of Los Angeles—a remarkable achievement. But telephone interviews revealed that on that day exactly, electrically sensitive people all over the world experienced stabbing pains in their chests, knife-like sensations in their heads, nosebleeds, asthma attacks, and other signs of severe electrical illness. Many did not think they were going to survive. Statistics published by the Centers for Disease Control reveal that the national death rate rose 4 to 5 percent during the following two weeks. All over the United States thousands of homing pigeons lost their ways during those two weeks. Several companies are now competing to provide not just cell phone service, but Wi-Fi, to every square inch of the earth from satellites in space, or from balloons, or from drones [6]. By 2015, there were over 2,000 communications satellites in Earth's orbit.

A vast amount of careful research on the dangers of electromagnetic pollution is summarized in The Bioinitiative Report [6]. "Human beings are bioelectrical systems. Our hearts and brains are regulated by internal bioelectrical signals. Environmental exposures to artificial EMFs can interact with fundamental biological processes in the human body. In some cases, this may cause discomfort, or sleep disruption, or loss of wellbeing (impaired mental functioning and impaired metabolism) or sometimes, maybe it is a dread disease like cancer or Alzheimer's disease. It may be interfering with ones' ability to become pregnant, or carry a child to full term, or result in brain development changes

that are bad for the child. It may be these exposures play a role in causing long-term impairments to normal growth and development of children, tipping the scales away from becoming productive adults. We have good evidence these exposures can damage our health, or that of children of the future who will be born to parents now immersed in wireless exposures [6]."

Further spread of very profitable wireless networks seems inevitable. For this reason it is vital that protective technologies be developed to prevent harm to those who are susceptible to environmental fields, and also for those who are meticulous about protecting their health.

3. Solutions to the Problem of Electromagnetic Sensitivity

Many devices claiming to protect against electromagnetic pollution can be found on the World Wide Web. One of the most promising and thoroughly tested is the PRANAN family of devices. Careful research by dedicated scientists in leading universities, beginning in 2011, has documented the safety and effectiveness of the PRANAN systems [7]. These studies involved measuring specific physiological parameters in subjects exposed to wireless devices and then introducing one of the PRANAN devices and following changes in the same parameters. It was thereby easy to document the physiological benefits. The scientists observing these positive effects were fascinated and puzzled by the results. The purpose of this report is to provide a logical explanation for the phenomena involved.

The devices have the following desirable characteristics:

- They are passive devices and do not store radiation.
- Their lifetime is unlimited if their structure is undamaged.
- They are automatically operational when carried close to the body.
- No maintenance or power source is required.
- They do not alter the proper operation of nearby electromagnetic devices.

There are several plausible explanations for how the devices produce the beneficial effects documented by measures of hormone levels associated with stress, brain wave analyses, and other laboratory methods. The 2014 González study [8] explained that the unified field theory of physics specifies that physical space is not an abstract mathematical concept, but instead that "empty" space actually contains energy in the form of various electromagnetic radiations. On the basis of basic physics it was concluded that the healthful radiation emitted by the PRANAN devices is environmental radiation that has been captured and filtered.

On the basis of several tests and electromagnetic theory, Dr. González concluded that it is the magnetic component of the electromagnetic fields and not the electrical component that has the beneficial effects. It was also recognized that the fields produced by the device are too weak to be measured by conventional detectors. But we know these fields are produced because of the biological effects. In these studies the human body is acting as a "biological assay" for a field that cannot yet be measured directly. Biological assays are widely used to evaluate the effectiveness of a procedure that is difficult to measure directly. They are essential in the development of new drugs and in monitoring environmental pollutants. Biological assays compare effects of a substance or procedure on a living test organism with the effects of a control.

4. Impedance Matching

To understand biological effects of electromagnetic fields it is necessary to understand the ways light and other kinds of electromagnetic fields cross the skin and enter the body. The technical issue is known as impedance matching. This is an electrical engineering term referring to the efficient transfer of energy from one medium to another, for example from air to the body. Impedance is the opposition of a system to the flow of energy from a source. In terms of electromagnetic fields and the human body, a valuable perspective is provided in a United States Patent awarded to Charlene A. Boehm [9]. The patent provides methods for correcting for the fact that the electrical permittivity in living body tissue is not the same as for air. Permittivity is measure of the resistance that is encountered when forming an electric field in a medium.

5. Geometric Patterns

In designing the PRANAN devices, considerable effort was made to select the proper materials and define the appropriate strategy for the front, back, and interior of the device to maximize effectiveness. The manufacturer suggests that the holographic geometries imprinted on the front and back of the devices (Figure 1) interact with the nanoparticle circuits (minerals, metals, conductors and semiconductors) inside the devices. The internal structures appear to act as frequency amplifiers or multipliers that generate harmonics of the incoming environmental signals. Frequency multiplication is commonly done in radio and microwave equipment to generate stable, low noise signals that are harmonics or multiples of an input frequency. Nonlinear circuit elements distort the input signal, generating harmonics. Other components remove unwanted input signals and undesirable harmonics. It is known that mineral crystals can be used to produce nonlinear effects that generate harmonics [10]. In the case of the PRANAN devices, the combination of the holographic geometries on the surfaces of the devices and the nanoparticle circuits inside are thought to generate a “melody of frequencies" that is beneficial to the organism.

The pattern on the face of the “PhiWaves” device (magnified to the left in Figure 2) corresponds to an ancient geometrical image found throughout nature, art and architecture. In modern times it is often referred to as the flower of life (right in Figure 2). The manufacturer did not choose these patterns to be decorative. They have a definite contribution to the effectiveness if the PRANAN technologies.

Very early representations of this same pattern can be found in the Temple of Osiris in Abydos, Egypt (Figure 3a). Most archaeologists maintain that they are at least 6,000 years old. Similar patterns have been recognized in other countries and cultures around the world. More modern drawings represent cosmological patterns recognized by the famous astronomers Giordano Bruno and Johannes Kepler (Figures 3b and 3c). These geometries are thought to represent a mathematical principle at work throughout nature [11]. Many scholars have evaluated these patterns and concluded that they may relate to a fundamental geometric aspect of time and space [12]. But precisely does this mean?

The mathematical aspect of these shapes is referred to as the golden ratio, golden mean, golden section, or φ (a Greek letter pronounced Phi) that turns up everywhere in nature - from chemical bonds in molecules to branching trees, skeletons of animals and the branching of their veins and nerves, spiral galaxies, and fundamental quantum physics - it is embedded in our brain waves, in music, electromagnetism, and in the heart of mathematics. Mathematicians since Euclid have studied the properties of the golden ratio. Phi received its original definition from Euclid as an "extreme and mean ratio" when a straight line is cut so that the ratio of the entire line to the longer division of the segment is the same as the ratio of the longer division of the segment to the shorter. Though measurable, Phi is an irrational number with relationships to the Fibonacci sequence, fractals, the

physical structure of things from plant growth and spiral shell development to the appearance of large-scale objects like galaxies, and more [13].

Some of the greatest mathematical minds of all ages, from Pythagoras and Euclid in ancient Greece, through the medieval Italian mathematician Leonardo of Pisa and the Renaissance astronomer Johannes Kepler, to present-day scientific figures such as Oxford physicist Sir Roger Penrose, have spent endless hours pondering this simple ratio and its properties. But the fascination with the Golden Ratio is not confined just to mathematicians. Biologists, artists, musicians, historians, architects, psychologists, and even mystics have pondered and debated the basis of its ubiquity and appeal. In fact, it is probably fair to say that the Golden Ratio has inspired thinkers of all disciplines like no other number in the history of mathematics [14].

The numerical value of Phi is 0.6180339 (continued on indefinitely). The golden mean was the Greek ideal of beauty and harmony, and has had a tremendous influence on architecture, art and design. Most of all, Phi has a host of extraordinary properties, enough to preoccupy generations of scholars, beginning with the ancient Egyptian pyramid builders, who might have followed earlier forebears of some esoteric knowledge, now lost in the mists of time. Most of what is known in more modern times came via the ancient Greek philosopher mathematicians Pythagoras (c570 BC - c495 BC) and Euclid (323 - 283 BC)[15].

Phi has been referred to as a magical or mystical or esoteric or even a spiritual concept (as in Sacred Geometry) but there are good reasons to believe it is actually an expression of a fundamental relationship between physics and biology; an expression of the geometry and energetics of space and electromagnetic fields, and their resonance with living matter. The creative power of Phi was somehow known to the ancients, and its properties have recently been confirmed by quantum physicists.

6. The Energetics of “empty” space

A recent presentation on the properties of so-called “empty” space can be found in a fascinating and very readable yet scientifically accurate book entitled *Void: The Strange Physics of Nothing* [15]. The book traces the lives and times of the famous scientists who had perspectives on the nature of space, and the shifting scientific consensus on this subject down through the centuries:

- Aristotle, Descartes and Leibniz all thought that space must be filled with some sort of “plenum”.
- Newton had a different idea. His theories of motion did not require space to have any structure. His concept of an empty void was supported by two centuries of research showing that a vacuum could be produced in a laboratory container with a vacuum pump.
- James Clerk Maxwell’s theory of light changed all of this, because light, as an electromagnetic field, had to consist of vibrations in some kind of medium. He referred to the medium as an aether.
- Einstein’s theory of relativity took space in another direction. Space and time exist in a fabric, which is curved. One of Einstein’s mathematics teachers in Zurich, Hermann Minkowski, described a new kind of space-time geometry that is now known as Minkowski space-time.
- In 1930, the British physicist Paul Dirac developed a theoretical model of the vacuum as an infinite sea of particles and energy which came to be called the Dirac sea. He received the Nobel Prize in Physics in 1933.
- Quantum physics returned physics to the plenum - a fullness, rather than an emptiness - called the quantum vacuum. According to quantum mechanics, the vacuum state is not empty

but instead contains fleeting electromagnetic waves and particles that pop into and out of existence.

The deep problem facing physics is the very tiny scale of the fabric of space, if there is such a fabric. It is far beyond the resolution of any microscope, and can only be “measured” or estimated indirectly. The scale, where relativity meets quantum mechanics meets gravity, is called the Planck length, which is 1.6×10^{-35} or 0.00000000000000000000000000000000016 meters.

A series of books by Vladimir B Ginzburg presents evidence that the universe has a spiral grain [16]. Following up on this topic led the author, who is a biologist and biophysicist, to study what is known about the geometry of space and the way light spirals through it. Specifically, both the cornea of the eye and the visual photoreceptor proteins (rhodopsin) are molecules with helical geometric arrangements that seem ideal for transparency to light that is following a spiral path [17]. This application of biology to solve a mystery in physics was an essential part of this inquiry about the PRANAN technologies.

The precise geometry of Phi derives from the Golden Ratio. One distinguished biophysicist, the late Mae-Wan Ho of the Institute for Science in Society in London, reported on this mathematics in a series of seven brilliant articles [18]. In 2014, Dr. Ho received the prestigious Prigogine Medal for her pioneering work in the physics of organisms and sustainable systems. One of Dr. Ho’s last scientific articles was entitled *Is Spacetime Fractal and Quantum Coherent in the Golden Mean?* [19]. The concepts in that report are directly relevant to the effects of the PRANAN technologies. And research by physicists has confirmed that the concept of Phi applies to the quantum fabric of space.

7. Phi at the quantum scale

On January 7, 2010, an international working group of leading physicists reported for the first time that solid matter has quantum properties defined by the golden ratio famous from art and architecture. The researchers were from the Helmholtz-Zentrum Berlin für Materialien und Energie (HZB), from Oxford and Bristol Universities, and from the Rutherford Appleton Laboratory, UK. The findings from the decade-long project were published in the journal *Science* [20]. The challenging experiments were carried out by world leaders in the field.

To study these quantum effects the researchers focused on the magnetic material cobalt niobate, which forms chains of magnetic atoms just like a very thin bar magnet, but only one atom thick. These chains are very useful for describing ferromagnetism on the quantum scale. Magnetism arises from the aligned spins of the magnetic atoms. The chains of cobalt niobate atoms act like a quantum-scale guitar string. The niobate “strings” were “plucked” with strong transverse magnetic fields.

Dr. Radu Coldea from Oxford University, who was the principal author of the paper, and who drove the international project from its inception a decade earlier, explained: "Here the tension comes from the interaction between spins causing them to magnetically resonate. For these interactions we found a series (scale) of resonant notes: The first two notes show a perfect relationship with each other. Their frequencies (pitch) are in the ratio of 1.618, which is the golden ratio famous from art and architecture." Dr. Coldea was convinced that this is no coincidence. "It reflects a beautiful property of the quantum system -- a hidden symmetry. Actually quite a special one called E8 by mathematicians, and this is its first observation in a material."

One of the scientists, Professor DA Tennant from Oxford, remarked on the perfect harmony found at the quantum scale. "Such discoveries are leading physicists to speculate that the quantum, atomic scale world may have its own underlying order [21].” The observed resonant states in a material are a dramatic laboratory illustration of the way in which mathematical theories developed for particle physics may find application in nanoscale science, technology and biology. The PRANAN devices appear to be an example of such an application.

8. Geometry and function

The next question is how the geometric patterns on the surfaces of the PRANAN devices and the materials in the device interior (graphene nanoparticles, graphite, silver, etc.) support the measured beneficial physiological effects. Modern thinking is that what we refer to as “matter” is actually a condensation of energy. Gilbert [22] has summarized:

“The foundation of all Life and all Creation is this geometric language in nature, which modern science is using to tap the powers of Nature in modern technology. All modern technology is based on the twin variables of SHAPE and MATERIAL; different shapes create different energetic effects, just as different materials offer a full spectrum of different useful energy qualities (energy expresses differently through metal electrical conductors than it does through wood, for example).”

9. Field interactions

The human body is an antenna, and picks up any large or small energy fields in the environment [23]. The human body has an overall biomagnetic energy field as shown to the left in Figure 4.

From basic physics we know that all energy fields, from the very smallest to the very largest, interact with each other. For example, your personal magnetic field is minute compared with the giant magnetic field of the Earth, but those two fields must interact with each other. Hence any field effect of the PRANAN device, minute as it may be, will influence the overall field of the body, which, in turn, will influence any of the fields within the body. All physiological activities involve energy fields [24]. We know from the work of Pall, described above, that living cells are extremely sensitive to minute fields. In fact scientists from the Department of Anatomy and Brain Research Institute at the University of California, Los Angeles had demonstrated that important processes can be much more sensitive to smaller fields than they are to larger fields [25].

Very tiny fields in the environment, such as those from a distant cell telephone tower or Wi Fi source, or from natural sources such as the Schumann resonances [26] can influence biological rhythms and other regulatory processes at the cellular level. (The Schumann resonances are a set of frequencies in the extremely low frequency (ELF) portion of the Earth's electromagnetic field spectrum. They are standing waves generated by lightning discharges in the resonant cavity formed by the Earth's surface and the ionosphere. They have distinct peaks at an average of about 7.83 cycles per second or Hz, with harmonics at about 14.3, 20.8, 27.3 and 33.8 Hz.).

Likewise, regulatory processes at the cellular level can be influenced by very tiny fields from devices worn on the body, including the PRANAN devices. Signals that are not natural can introduce noise into finely-tuned regulatory networks, producing physiological chaos and symptoms that are sometimes very peculiar. The minutest shifts in energy fields enabled by the PRANAN devices worn on the body will be sensed by every cell in the body.

A second mechanism for the actions of the PRANAN devices is based on some remarkable research by Dr. Jean-Claude Guimberteau, MD, a famous hand surgeon in Bordeaux, France. His award-winning research explored, for the first time, the architecture of the skin and the tissues under the skin, called fascia. The studies involved a sophisticated fiber-optic probe connected to a high definition video camera allowing high magnification [27]. His remarkable video recordings [28] have been presented at 4 International Fascia Research Congresses [29].

The finding from Dr. Guimberteau's research that is of great interest here is the geometric pattern found on the skin surface and in the tissues immediately below the skin, called fascia. As shown in Figure 4c, the skin surface has a framework of polyhedral structures, and this polygonal pattern repeats below the surface of the skin, in the connective tissues (Figure 4d). It should also be noted that the PRANAN devices have hexagonal geometric patterns engraved into the side facing the body, as shown in Figure 4b.

The author proposes that these patterns are ideal for transmitting beneficial frequencies from the environment to the interior of the device, and from the device into the body. The mechanisms involved in both instances involve resonances between the geometric patterns in space, the patterns on the surface of the device, the geometric patterns on the side of the device facing the body and the geometric patterns in the tissues, as discovered by Dr. Guimberteau.

While it is controversial, the author believes some of these frequencies may be the morphogenetic fields responsible for the origin and maintenance of biological form and function as proposed by Rupert Sheldrake [30]. The reason for suggesting this is the origin of form in living bodies is unknown, and Dr. Sheldrake's ideas about a morphic field, and the resonance phenomena just described, are worth taking seriously. Phi could be key to the coupling of information in the morphic fields in space with the human body. If this is so, another speculative model for the effects of the PRANAN devices can be proposed: they amplify the frequencies related to the morphic fields and thereby help maintain cell and tissue functions at their optimum structure and function. It is noted that the discovery of Phi at the quantum scale has been enthusiastically received by quantum physicists [31].

Figure 1: *There are three categories of PRANAN devices. At the left is the version designed for personal use such as in a pocket. This device has protective effects for all types of environmental radiations. A smaller version is designed to be affixed to mobile phone cases, with the aim of protecting users from the microwave radiation emitted by the phone. A third invention, shown at the right, called Biospace, protects persons in a space such as a room in a home or office. Its range is approximately 9 meters.*

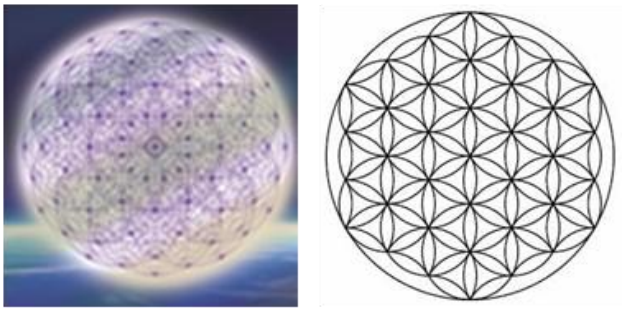

Figure 2: *The design on the front of the PRANAN device (left) is comparable to the "flower of life" design shown to the right.*

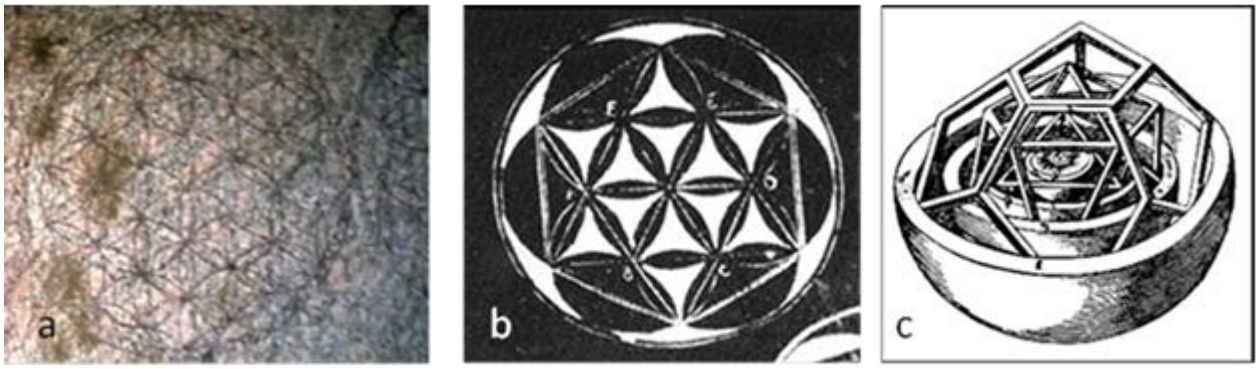

Figure 3: *Very early representations of Phi can be found in the Temple of Osiris in Abydos, Egypt (a). More modern drawings represent cosmological patterns recognized by the famous astronomers Giordano Bruno and Johannes Kepler (b and c).*

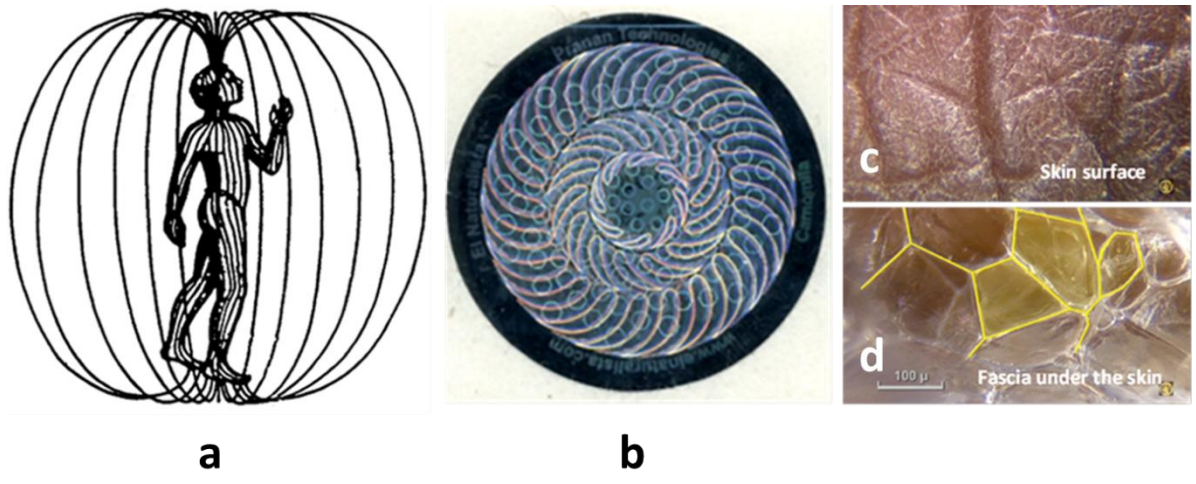

Figure 4: *The overall biomagnetic field of the human body (a), the side of the PRANAN device that faces the human body (b), the geometric pattern on the skin (c) and the geometric pattern in the underlying fascia (d). (a is from Gordon, R., 2004. Your Healing Hands: The Polarity Experience. North Atlantic Books. b is a photograph taken by the author. c and d are from Guimberteau, J-C, and Armstrong, C., 2015. Architecture of Human Living Fascia. The extracellular matrix and cells revealed through endoscopy. Handspring Publishing, Edinburgh, U.K.)*

Conclusions

Cellular telephones, Wi-Fi, and electric power have revolutionized our communications and lifestyles. Wireless technologies have become one of the fastest growing and most profitable industries, with billions of users around the world. People love their conveniences and companies want to protect their profits. However, an increasing number of people are becoming sensitive or allergic to the electromagnetic fields produced by modern communications and electrical appliances. Many of those who are sensitive recognize that their symptoms are caused by EMF exposures from a variety of sources. Many more people have mysterious symptoms but do not understand the cause. Research indicates that the health of those who have no observable ill effects may still be compromised at a subtle level and the effects may be cumulative, much like the effects of the buildup of environmental chemical toxins in the body. Indeed, Cyril Smith and others have shown that there is a strong similarity between chemical and electromagnetic allergies.

Human beings are bioelectrical systems. Our hearts, brains, immune and endocrine systems are regulated by internal bioelectrical signals. Hence environmental EMFs can interact with fundamental biological processes in the human body and create chaos in the delicate regulatory fabrics that are vital for our health. This can result in peculiar symptoms that are challenging for physicians who are not familiar with EMF effects. Treating these hypersensitive individuals can be perplexing because conventional medicine treats symptoms, but this usually does not work for these patients. The customary prescribed drugs often have side-effects that can make matters worse. When the frustrated patient returns to the clinic, the doctor often recommends psychotherapy, but these unfortunate patients are not psychotic. They have electrosensitivity, a condition that is now a legally recognized disability in some countries. None-the-less, Manufacturers and many national health authorities often repeat old and inaccurate information, such as:

- Microwaves from mobile phones and other wireless devices cannot possibly do any harm
- There is no known mechanism for such radiation to impact health
- Research finding biological effects is too flawed and inconsistent to provide evidence

Each of these assertions has repeatedly been proven completely incorrect (see reference 4). They are the legacy of an old idea that radiations must heat or ionize tissues in order to have biological effects. Modern research has clearly demonstrated that living systems are far more sensitive than we realized when those ideas were proposed many years ago. This means that protective technologies such as the PRANAN devices are actually important for everyone. Moreover, there are indications that plant and animal life can be affected. For example, bee keepers as well as farmers should take note of this report because there is evidence that the global decline in bee populations may be caused in part by EMF exposures. And a very recent report by Taheri and others demonstrated that 900 MHz GSM (Global System for Mobiles) mobile phone radiation and 2.4 GHz radiofrequency radiation emitted from common Wi-Fi routers decreases the susceptibility of microorganisms to different antibiotics. All of these effects are damaging our health and the health of children of the future who will be born to parents now immersed in wireless radiations.

Further spread of very profitable wireless networks seems inevitable. For this reason it is vital that protective technologies be developed to prevent harm to those who are susceptible to environmental fields, and also harm to those who are meticulous about protecting their personal health and the health of their families. This article was written because extensive testing at leading universities revealed that the PRANAN devices have a variety of measurable beneficial effects on vital physiological processes, but the reason for the effects was unclear. An explanation for the effects has been proposed based on emerging understandings of the physics and geometry of electromagnetic

fields and the quantum vacuum. It is proposed that the devices maintain cell and tissue functions at their optimum structure and function by converting potential harmful EMF's into beneficial biological frequencies.

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