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Health hazards and electromagnetic fields

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Summary Biological rhythms, physical wellbeing and mental states are dependent on our electrical brainwave system interacting with the extremely weak electromagnetic fields generated by the Earth's telluric and Cosmic radiations. In a single generation, since the evolution of humankind over millions of years, we are exposed to a wide range of powerful, artificially generated electromagnetic radiation which adversely affects the subtle balance in nature's energy fields and has become the source of so-called 'diseases of civilisation'. This also includes electromagnetic sensitivity. Generally, there is a lack of awareness and understanding of the impact electromagnetic fields can have upon health and wellbeing.

Our ancestors were acutely aware that certain locations, were perceived to have a positive energy field which was beneficial to health and vitality. Over time, these areas are now referred to as *sacred sites* for spiritual ceremony and as healing centres. In contrast, there are other geographical locations that can have a negative effect upon health and these are known as *geopathic stress zones*. It is believed that such zones can interfere with the brain's normal function that inhibits the release of melatonin and other endocrine secretions needed to replenish the immune system. Geopathic stress can affect animals and plant life as well as human beings and significantly contributes to sick building syndrome (SBS).

Whilst there is an increasing body of opinion amongst eminent researchers and scientists who are addressing these issues, the establishment professions are slow to change. However, very gradually, modern allopathic medicine and attitudes are beginning to recognise the extraordinary wisdom and efficacy of ancient traditions such as acupuncture, light, colour and other therapies based on the understanding and treatment of the interaction of a person's electromagnetic subtle body and the immediate environment. These and many other 'complementary' therapies may soon become mainstream medical practice. In the meantime, we can help ourselves by learning how to detect the hazards and daily practise prudent avoidance.

Introduction

> There is a need to have a greater understanding of how the mind and body respond to the environment…[and]…the external forces created by both nature and Man…One area that is neglected is the interaction between the body and the electromagnetic fields around it…[and] any correlation between wellbeing and ionisation. The increasing amount of Man-made disturbances in and near the Earth plus electromagnetic pollution above ground in the form of radio and television waves and telecommunication networks has tipped the natural balance in the wrong direction, so that many locations are disturbed.
> Derek Clements-Croome, Professor of Construction Engineering, University of Reading.[1]

Our mind, body and the function of our endocrine glands and immune system are controlled by extremely weak electrical brainwaves that interact with the electromagnetic environment. Thus it is reasonable to question whether naturally occurring and man-generated electromagnetic fields be the source of health hazards. If so, can the location, siting, architectural design and installed equipment of any building have an impact on mental and

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physical health? For example, can hospitals, clinics, places of healing and recovery provide a positive therapeutic environment if the holistic nature of human beings is disregarded?

The Earth's natural, electrical and magnetic fields create a constant interaction—called 'zones of resonance' or 'patterns of interference'—between terrestrial energy fields and cosmic radiation originating from the Sun, Moon, Planets and Milky Way. Without these interacting, extremely weak fields of subtle energy we would not exist, plants could not survive, birds and animals could not navigate, turtles could not return after 30 years at sea to the beach where they were hatched, and the tides of the oceans would not rise and fall. All biological systems not only interact with external electromagnetic fields at a cellular level but the extremely low frequencies that relate to human brainwaves can have a far greater effect than generated power.

We have evolved on Earth over three million years but in one single generation we are now exposed to unnaturally high levels of a wide range of generated electromagnetic radiation. Suddenly, this powerful force is available but without any guidelines to help us fully understand it or regulate its use.

To put this paper into context with regard to the electromagnetic environment, let us consider a typical hospital ward. Commonly, patients lie on a steel-framed bed. Above the patient's head will be an array of electronic and electrical equipment. Similarly, in a typical bedroom at home, next to the bedhead there may be a table lamp, electric clock, possibly a mobile phone on charge, a stereo and tv remote controller, even an electric blanket—all 'encased' in a standard ring main circuit. A young person's bedroom may also include a computer and printer.

A steel-framed bed, iron bedstead or electric blanket will act like an antenna; the equipment and wiring create an electromagnetic 'smog' that can impede the healing process and affect the wellbeing of the individual. In addition to this smog effect on brainwave patterns, a dehumidified atmosphere in the room can create static electricity causing free particulates, dust and other chemical pollutants to accumulate around the bed.

Where possible, patients should be transferred to a wood framed bed and all electronic/electrical apparatus should be removed from the bed head and mounted on a mobile trolley keeping it away from the patient's head. Bowls of flowers in rooms or wards increase humidity levels and reduce the build-up of static electricity.

Ideally, a hospital is a healing environment; a place to restore spirits, vitality and an environment which can promote patient's self-healing process. Ironically, they tend to be designed ergonomically and primarily facilitating hospital staff with the patient afforded little consideration.

The focus upon health design is attracting some attention however. Since 1988 Wayne Ruga, Chief Executive Officer (CEO) of the American Centre for Health Design, has organised an annual series of symposia on healthcare design. The 1995 meeting, held in San Diego, was attended by fifteen hundred architects, designers, physicians, nurses and healthcare decision-makers and almost everything about hospital design was based on function or medical technology. However, there was little awareness of the potential health hazards created by actual building design as well as the effects of electromagnetic fields impacting on our health and wellbeing.[2] In other words, there was little or no concern for the patient's experience.

Many architects and designers tend to have little or no understanding of the effects and hazards the full spectrum of electromagnetic fields might have in hospitals, houses, schools and offices. It is common for hospitals to experience fluorescent lighting twenty-four hours a day, low humidity, restricted air conditioning and ventilation systems, tinted glass windows, and building and furnishing materials that are some of the root causes of sick building syndrome.[3]

In 1983, Bogota, Colombia, The Kangaroo Project (so named after the marsupials that carry their young in a stomach pouch) was developed. A hospital in Bogota, ran out of perspex life-support capsules normally used for incubating premature babies where they live for several weeks in a warm, protected, comfortable, hygienic environment until strong enough to live a normal existence. To overcome the desperate shortage of capsules, the mothers were given their naked premature babies to hold next to their breast. Together, wrapped in a blanket, mother and child spent much of the day and night in kangaroo fashion. It was discovered that the physical bonding of mother and child accelerated lactation and the survival rates of the babies was as good if not better than the incubation beds. Since then, a number of hospitals have discarded the use of perspex capsules in favour of the kangaroo technique.

Whilst it could be argued that the close proximity of mother and baby clearly had an impact upon health and wellbeing, a baby's sterile isolation in a plastic capsule can be detrimental to its development and recovery. Common terms such as plastic boxes; sensory deprivation; isolation; infrequent

human contact; artificial ventilation; unnatural environment are also phrases commonly used by occupants of many contemporary buildings.

What are electromagnetic fields?

An electrical current in a wire is like water passing through a pipe. Pressure is needed to force the water to flow through the pipe: an electrical current needs a *voltage* to be applied before it can flow through the wire. The higher the voltage, the stronger the electric field and the stronger the current, the higher the magnetic field. A 'live' cable will generate an electric field radiating from the cable but the strength reduces as the distance from the source increases. A switched off table lamp but still plugged into the mains will radiate an electric field but there is no magnetic field until the appliance is switched on. The magnetic field strength also diminishes in strength as the distance from the source increases.

Electric and magnetic fields are considered to be independent at low frequencies but as the frequency increases to the kilohertz range the fields combine into one electromagnetic field. The power of an electromagnetic field, is determined by its wavelength and frequency (the rate at which it oscillates) and can be likened to ripples on the water. The distance between the ripples is the wavelength or cycle, and the number of waves occurring in a given time period is the frequency or vibration. Frequencies are measured in Hertz, and the full cosmic spectrum of electromagnetic fields run from zero to lightwaves.

The Earth's natural electromagnetic fields and all biological systems operate at extremely low frequencies between 1 and 30 Hz. The band up to 300 Hz is designated extremely low (ELF) and voice frequency (VF). (Mains power in the home is 50 Hz in the UK.)

The 3 kiloHertz (kHz) to 300 kHz bands of the spectrum are used for heating, radio-telegraphy and medium-wave broadcasting. (Human hearing is in the range between 10 and 16 kHz.) The 3 megaHertz (mHz) to 300 mHz bands are used for radio frequency and VHF broadcasting and the range 3 gigaHertz (gHz) to 300 gHz bands are used for satellite and military purposes, TV broadcasting, hi-tech medicine, mobile phone transmission and microwave ovens. The teraHertz (tHz) band of the spectrum includes infrared light, visible light (the colours red, yellow, green, blue, violet), ultraviolet (UV) light, X-ray and gamma ray frequencies.

Relative to the vast array of the cosmic spectrum, the band of colour visible to humans is infinitesimally small. Each colour has its own unique frequency—for example, red has a slow 'vibration' compared to the faster frequency of violet. Through the eye the brain interprets the electromagnetic vibrations, enabling us to see colour. At a subliminal level we respond to these colour frequencies: red is a colour that stimulates our energy levels which gives rise to 'red-light districts'! We also have built-in mechanisms enabling us to respond to frequencies outside our range of sight, smell and taste—for example, the body can be burned by UV, infrared and microwaves.

Colour/light therapies have been practised throughout the ages since early Egyptian times. There are light-receptive elements in the cell membrane and the mitochondria called chromaphores and porphrins. Theses absorb particular colours (wavelengths) of light and near infra-red radiation. When a cell is under stress or compromised in some way it responds to light and colour and returns to function normally. Photobiomodulation therapy uses low intensity lasers and light emitting diodes to help heal wounds and sports injuries as well as diabetic and venous ulcers (see http://www.thorlaser.com).

Energy fields and sacred sites

Why do some locations have a magical aura that gives us natural vitality and a sense of harmony and wellbeing, whereas other places can make us feel perturbed, uncomfortable, or even ill?

Cosmic fluctuations and global energy fields vary as their relative positions of the heavenly bodies constantly change: variations in the geological structure interact and modify the Earth's energy field. The uniqueness of every location is determined by trees, mountains, hills, rivers, underground streams, rock formations, stones and other changes in the environment, such as buildings.

This interaction of the Earth's geomagnetic field with solar activity creates the magnetosphere which shields our planet from harmful cosmic radiation and constantly changes during a 24-h period. The path of the solar wind deflected by the rotating Earth changes the strength of the magnetic field which affects, at a subtle level, the biological systems of all living things. The geomagnetic field of the Earth's surface also fluctuates causing unique variations and degrees of concentrations from one location to another.

Research by Professor Orley Taylor et al. at the University of Kansas, has established that migratory insects use the magnetic sensors in their head and thorax to navigate by the Earth's magnetic field rather than by the Sun.[4]

Megalithic settlements of people and the development of sacred sites of for example stone circles and alignments, appear to be located where positive energy fields could be utilised for healing, fertility, food production and good health. This highly developed intuitive knowledge and sensitivity of energy fields evolved into a spiritual reverence and 'Sacred Earth' culture that persisted well into mediaeval Europe.

The Earth's crust is rich in quartz—the most common form of crystal—with high magnetic and piezoelectric properties. When quartz is struck or subjected to pressure it will emit negative ions that create an electromagnetic field causing the crystal to act as a transducer of energy, converting the electrons into other forms such as ultrasound and light. The crystalline continental plates, constantly under pressure due to gravitational pull and other outer-space activity create fluctuating levels of energy and high voltage piezo discharges.

'Fault lines' occur where the pressure on the strata of the Earth's surface 'squeezes out' piezoelectrical discharges of ionised air that creates luminous rays, 'eerie lights', ghostly 'will-o-the-wisp' and 'curious flames'. Blazing lights phenomena are flashes of energy erupting from geological piezoelectrical activity. Sites associated with magical, psychic and paranormal activities such as haunted houses often occur along geological fault line locations.

Dr. Persinger, who runs the Neuroscience Research Group at the Laurentian University, Sudbury Ontario, Canada, studied patients with temporal lobe epilepsy (TLE). He noted that for some patients, abnormal brain activity induced forms of hallucinations and feelings of 'not being alone'. He devised a helmet to focus a weak, rotating magnetic field on the region of the temporal lobe area of a person with no TLE medical condition to induce the wearer to have similar experiences.

He cites the case of a parent who was deeply concerned about her daughter's nightly terrifying experiences of horrific supernatural visitations and haunting spirit entities. Persinger was convinced her hallucinations were caused by fluctuating electromagnetic fields that may have emanated from an underground fault line or overhead high tension pylons. However, he identified the source to be an unusual magnetic frequency pattern emanating from the clock radio next to the girl's bed. When the clock was removed from the room, the hallucinations ceased. It would seem that certain electromagnetic and geomagnetic activity can interact with temporal lobes to the point where the incidence of seizures and convulsions are increased.[5]

Professor Richard Wiseman's research into haunted houses has indicated that experiences of ghosts, paranormal presences and other strange feelings can be caused by unusual frequencies of electromagnetic levels.[6] Indeed, British ophthalmologist and Fellow of the Royal Society of Medicine, Ann Silk, has investigated the many haunted houses on the Isle of Wight and claims all either lie on or are close to the geological fault line running east–west along the length of the island.

Are these strange lights, ghostly knockings, footsteps and door openings caused by piezoelectric activity; can high levels of static electricity make our hair stand on end? It may be that claims of sudden icy cold feelings in a room, despite the thermometer recording normal temperatures, may be due to rogue electromagnetic fields interacting with the hypothalamus in the brain, which is responsible for the regulation of body temperature controlled by the pineal gland. It seems likely that a weak electromagnetic energy field can induce altered states of consciousness by an interaction with the pineal and pituitary gland secretions.

These recent studies do not suggest that all religious or paranormal experiences and belief systems are entirely due to electromagnetic fields but they do serve to illustrate the extraordinary biological and emotional affect of the natural environment.

Geopathic stress

'In-phase' (compatible) energy waves emitted from two separate objects result in a positive (beneficial) energy output: when waves are 'out-of-phase' the combined energy is incoherent, negative and detrimental. Not all living organisms have an adverse reaction to negative energy fields but human beings need a positive and coherent energy input to maintain health and vitality. A negative signal can set up an interference pattern causing a malfunction to our brainwaves and cells.

The Earth's magnetic force-lines from the North to the South Pole are like the meridians of longitude. The horizontal meridian lines, like patterns of latitude are known as the 'solar net'. This magnetic network covers the globe to provide a 'reference grid' for navigation by all sea creatures.[7] The existence of such a network has

been supported world-wide by geophysicists and seismologists since the nineteenth century. Ann Silk quotes the NASA satellite images of energy waves from earthquakes and fault movements that travel vertically and horizontally along and through the plates.[8]

Zaffanella[9] suggested that electric or telluric Earth currents, either natural or caused by buildings, quarrying, reservoir loading and electric trains, can reactivate faults to generate piezoelectricity. This may be due to high electrical conductivity deposits in the earth, such as certain metallic sulphides and graphites, and the oxidation processes associated with groundwater.[10]

Dr. Ernst Hartmann (1991) founded the research centre Forschungskreis Fuer Geobiologie to promote lectures and research how the mind, body and soul interacts with the natural environment. Other factors such as the interplay of culture, civilisation, the Earth energies and the actual location of one's own home were also included and in his research[11]. *He* has focused upon the biophysical forces of the Earth's energy fields, their impact on the body's organs and their contribution to triggering illnesses and the degeneration or mutation of cells. Hartmann expressed a desire that the inter-relationship of all natural and artificially generated electromagnetic fields with all living organisms be profiled for the safeguard of evolution and ecology.

Geopathic stress zones occur where there are geological fault lines, fissures in rock formations, mineral seams and subterranean streams. These unique factors affect the thermic radiation and magnetic field characteristics of a particular place and determine whether a location's positive or negative 'spin' has either benign 'zones of resonance' or malign 'interference patterns'. Malign areas, known as 'geopathic stress zones', are feint, electrically charged wide bands or narrow veins that have a detrimental effect on the subtle energy balance in our body.

A clockwise spin's positive resonance with the body will enhance our sense of wellbeing: it might also induce psychic experiences. Sites and buildings recognised as being 'sacred' or having therapeutic qualities have been built over a well, crossing underground streams, or hot springs. Where a location has an anti-clockwise pin the interference pattern creates a negative effect. Underground streams, even those flowing sluggishly, generate a weak electromagnetic field: the current build-up concentrates the thermic neutron radiation from deep with the Earth and generally sets up a negative, anti-clockwise spin. These concepts may also be one aspect of Feng Shui.

Long-term exposure to geopathic stress can be detrimental to health and although certain diseases are not necessarily directly attributable to a particular location, harmful rays can trigger the start of an illness by weakening the immune system.

The effect of geopathic radiation on biological organisms became the subject of a Polish state-financed central research programme co-ordinated by the Polytechnic in Szczecin (Stettin) which addressed the harmful effects of subterranean water veins and global grids to explore if there was a relationship with the position of the beds of patients who had died of cancer. At one hospital, a patient's bed was located over the crossing of interference zones where tests identified a steep rise in the magnetic field. After removal of the spring mattress and iron bed frame with wire netting, the magnetic radiation was reduced by one sixth. The results, published in 1989, formed the basis of new guidelines for Polish town planners, architects and construction engineers.[12]

As early as 1928, Von Pohl studied the high incidence of cancer in Bilbiburg, Bavaria. He showed that dwellings where cancer deaths had taken place were located over malign veins and even claimed to be able to both predict the room and position of the bed used by the cancer patients.[13]

Clements-Croome cited Thurnell-Read[14], who stated that geopathic stress has been found to affect the immune system, suggesting that '...where geopathic stress energy has the same resonance as a particular body or organ, then the adverse energy effect will be maximised.' A geopathic stress vein could be a narrow band snaking across a building: if it crosses a bed or favourite sitting position where we spend several hours a day it could affect our general health—however not everyone's reaction will be the same.

Electromagnetic sensitivity

An overdose of radiation—such as solar flares, geopathic stress or generated electromagnetic fields—can produce abnormal biological changes that can impair the release of vital endocrine secretions. Dr. Reiter, Professor of Neuroendocrinology, University of Texas Health Science Centre reported evidence that exposure to low-frequency electromagnetic fields can reduce melatonin level secretions by as much as fifty percent.[15]

Ions in the blood have a range resonance with the Earth's geomagnetic field and an alternating field ranging between 1 and 500 Hz. An electrical or magnetic field applied near this resonance

frequency can impact upon the lymphocyte cells which will affect the immune system response and could be the source of many diseases such as lymphatic leukaemia.

The ambient electromagnetic fields in an average urban environment are relatively low, but when using everyday electrical household equipment such as washing and sewing machines, hair dryers, TVs and computers, our exposure is substantially higher. It is raised even higher by radio frequency and microwave apparatus. Our natural ions, tissues, blood cells and body movement can be affected by high-frequency electromagnetic fields which reduces the ability of white blood cells and impair the function and control of the hormone and central nervous systems.

Pioneering work on EMS begun in 1980 by Dr. Jean Munro and Dr. Cyril Smith at the Breakspear Hospital in Hertfordshire has since become one of Europe's leading authorities on environmental illnesses. An electromagnetic overdose or long-term exposure can trigger a biochemical reaction and once a person becomes sensitised, symptoms intensify and often persist for many years but you do not necessarily have to live under high-tension cables or be a prolific user of a mobile phone to develop the condition.

Ann Silk's research indicated that wires used in underwired bras, acting as re-radiating antennas, could resonantly amplify radiation to the breast. A Spanish company, *Intima Cherry*, has launched a range of underwear made from *Nega-Stat*, a material it claims cancels out EMFs![16]

Many VDU users suffering painful forms of dermatitis, can develop into sensitivities to other electrical equipment and sunlight. The question of whether VDU screen use has influenced miscarriage rates has been hotly debated for many years. Bastide (1997) at the University of Montpelier in France studied the effects of continuous exposure of embryos and young chickens to electromagnetic fields emitted from both TVs and VDUs, which indicated increased foetal loss (47–68 per cent) and depressed levels of immune, adrenal and pineal functions.[17] Clearly this issue will continue to be debated and far greater research into these issues is required.

In 1997, at the Ninth International Montreux Congress on the changing electromagnetic environment, Dr. Adey, referrred to power-line magnetic fields and extremely low frequency and electromagnetic fields. He claimed there his findings were significant in four areas:

- The effect of electromagnetic fields impedes the functioning of the immune system and in particular reduces the white blood cells.
- Epidemiological studies suggest there may be a correlation between abnormal foetal development and miscarriages with electrical blankets and other appliances such as home heating or night storage heater systems.
- Electromagnetic environments may have an effect on control and regulation of cell growth.
- The effect on the central nervous system and brain controlling the hormonal mechanisms.[18]

Conclusion

Since electrical power was first generated in 1880, medical science has invented the most wondrous machines and equipment that undoubtedly have revolutionised the diagnosis and treatment of illness and diseases. On the other hand, the medical and architectural professions and science generally have ignored the harmful and often insidious effects the resultant electromagnetic smog and pollution has on our subtle sensitivities. Charles Zang who has written extensively on the human electromagnetic subtle body suggests that electromagnetic fields may '…play the same important role as, or even a more important role than the chemical body…In traditional Chinese medicine, emotion is regarded as the main cause of a majority of diseases; whereas, in classical western school-medicine, the human body has been considered as a complicated machine and the medical doctor has been regarded as a sophisticated expert to repair it when it is out of order.'[19]

He suggests that present day biology and medicine will be superseded in the immediate future by the study and practice of electromagnetic body therapy and treatments which, in many cases, are the basis of current complementary medicine, such as ancient medical traditions and acupuncture; light, colour, sound and aroma therapy; etheric body healing, meditation and chakra system rebalancing and so on.

In the meantime we must exercise prudent avoidance to both monitor and protect ourselves from the day-to-day environmental hazards.

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The time to relax is when you don't have time for it. (Harris)