GEOPHYSICAL BACKGROUND, TARGET STRUCTURES AND EFFECTS OF GEOPATHIC STRESS ZONES, AS DETECTED WITH GAS DISCHARGE VISUALIZATION (GDV) METHODOLOGY

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Appendix

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1. GEOPATHIC STRESS ZONES

For thousands of years, the existence of specific locations where people do not feel well has been empirically known (e.g., 1-3). These places can make people more aggressive, reduce work performance, interfere with the quality of sleep and as a consequence, make them more likely to acquire a disease. Dowsers and geobiologists have called the stressors present at such zones “water veins” or “Earth rays“. These terms, however, are misleading and technically incorrect. In recent years, scientists have introduced the expressions “geopathic stress zones” and “geopathic interference zones”. A more holistic term for those places adversely affecting humans and animals would be "stress locations". Technical electromagnetic fields (EMFs), and many other types of stressors can be present in addition to certain geologic characteristics.

Only rudimentary evidence is available today, if and how these “adverse energy fields” could be measured using scientifically accepted physical apparatus. Our real knowledge on the geophysical reasons for stress

locations is yet very limited. It is clear that the phenomenon is composed by a variety of causes, with different compositions and intensities present at various places. Today, for most aspects of geopathy, only hypotheses can be formed - and there are many of them. Most popular attempts to explain geopathy concentrate on the possible existence of natural EMFs present at particular locations which "interfere" with the organism. Their origin is presumed to be in the ground – below the Earth's surface. Frequencies in between about 0.1 Hz up to the GHz-range have been suggested in public literature.

One of the reasons why an incontrovertible physical measurement of the assumedly existing EMFs appears to be impossible at present could be that these are very variable, possibly broad-banded, and at the same time only present in very low power strengths, "hidden" in the surrounding electromagnetic noise. An apparatus able to discriminate low energy broadband EMFs from noise apparently is not yet available. One or our approaches to address geopathy is to utilize the organism and measure certain aspects of its bodily and psychological response. A recent technological innovation might aid us in the quest of physically measuring deviations of the Earth's magnetic field: Super-Conducting Quantum Interference Devices (SQUID) allow quantifying variations of one ten billionth [American English] of the Earth's magnetic field. This highly sensitive but also very costly technology is being used successfully in medical science (e.g. optical cardio-magnetometry), in detecting material defects and cracks in aircraft parts, in archaeology, and for tracing natural resources (e.g., 4). Another, much lower-priced methodology has been recently suggested by Indian researchers who used a self-constructed prototype apparatus based on light interference and laser technology and is claimed to detect geopathic deviations (5).

2. HYPOTHESES OF ORIGIN AND EFFECTS OF FIELDS FROM THE GROUND

One can assume that there are many origins for the effects of different locations on humans, animals and plants. Surely it's not one, single, definite kind of "radiation". In addition to the discussed weak, broadband transversal electromagnetic and magnetic fields assumed to be originated in the ground, other forms of "energies" might exist, such as the often controversially discussed longitudinal scalar waves (6). Various possibilities of combinations are imaginable. Overlapping, or a "build up" of resonance effects are also part of the geopathic phenomenon.

Furthermore, technically generated EMFs are present on every place on Earth; their likely influence on our health is presently the subject of intensive worldwide research. The so called "space weather" (including *Schumann-fields*) also plays a role (7). In our following attempts at elucidation, we will concentrate on natural sources possibly originating from the "ground", i.e. the very outer skin of our Earth.

2.1. Electromagnetic Fields "From the Ground": Stringy Waterways

Low energy, broad-banded EMFs of dynamically changing frequency composition, sometimes creating resonance with structures of the human organism, may well be part of the geopathy phenomenon. It is a fact that both, technical and biological systems are influenced by EMFs – depending on their nature, intensity, frequency composition, modulation patterns and time course. Numerous questions are still open, such as the concerning limits and the character of physical interference fields (6). There is growing experimental evidence that EMFs - at least those of technical origin – can have significant effects on cells and the entire organism. Unwanted effects include, for example, serious damage of the genome (including field-induced DNA strand breaks) (8-13), suppression of the immune system (14), changes in whole cascades of molecular mechanisms involved in transcription (15), and also on proliferation and apoptosis, e.g. of neurons and neuroendocrine cells (16). Most recently, we have published effects of technical EMFs on well-being (17) and changes of various psychological parameters in connection to frequent use of mobile phones (18).

But where in the ground could sources of natural EMFs exist? Such fields could be induced by specific metallic ions and /or metal particles contained in water, flowing in streams or, most often, in so called "stringy waterways" or aquifers through the pervious and anisotropic rubble-/gravel-/sand-/soil-body of the natural ground *(Fig. 1)*. Certain ions and metals moved by water can – depending on concentration, composition and flow rate – indeed lead to geoelectric charging.

Moving groundwater can be regarded as a major reason for geopathic stress. Most people think that water travels underground in free flowing rivers, like it does on the surface of the Earth. This opinion has been caused by misleading dowser's terminology which frequently uses the word combinations "water veins" or "water vessels". However, the only time water flows freely underground is on relatively rare occasions

when it travels through caves or caverns, e.g. present in karst regions of decomposited limestone – but this is not common elsewhere.

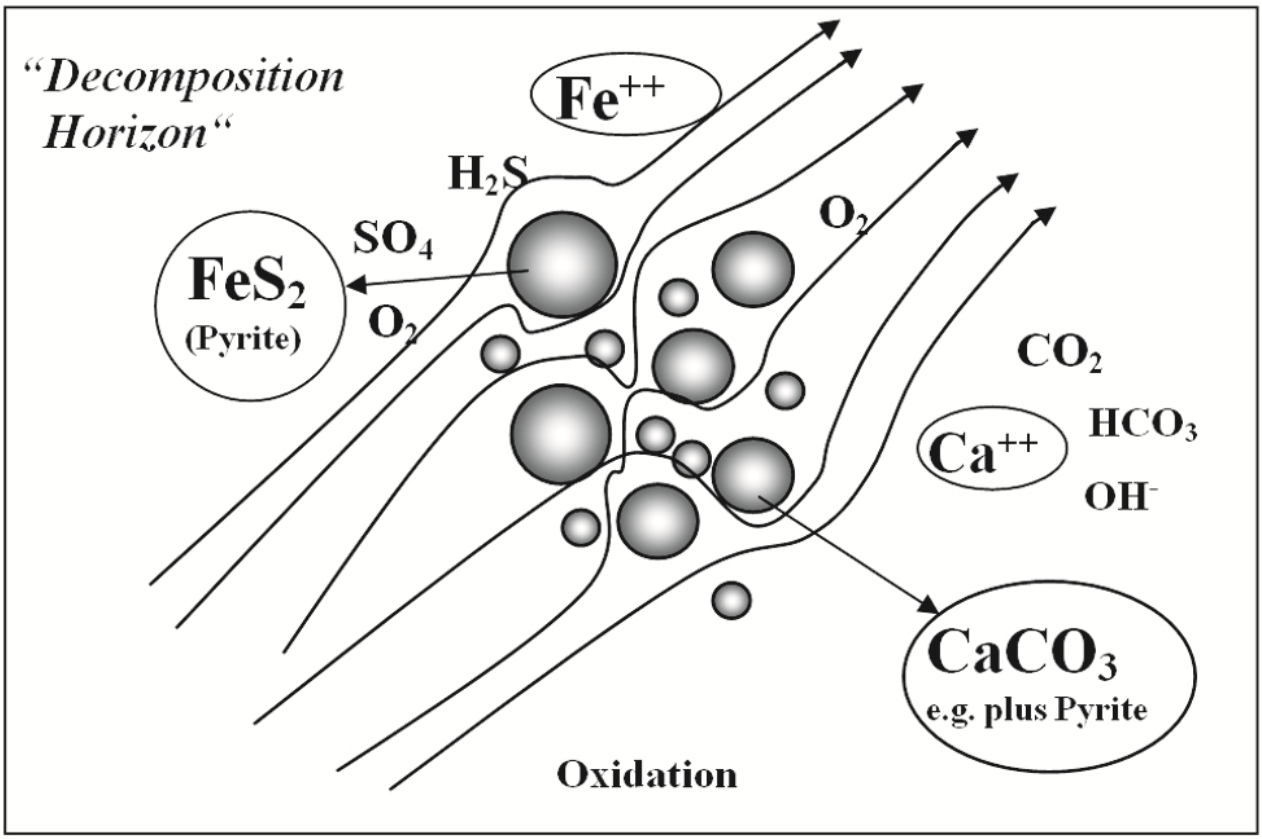


Fig. 1: *Hypothesis for the origin of certain geopathic phenomena: With varying speeds and amounts, water flows through the anisotropic, pervious ground (rubble, gravel, soil; sometimes (seldom) also inside larger cavities), thereby taking up decomposition products (e.g., from lime ($CaCO_3$) and from pyrite (FeS_2)) produced in redox reactions, and metallic particles, which, when transported in water, will induce EMFs. Moved metal particles and/or ions (Fe^{++}, Mg^{++}, Ca^{++}, $NO3^-$) may lead to geoelectricity, composed of low-power and assumedly broad banded dynamic field changes. Power densities, frequency composition and course of those EMFs depend on type, composition and amount/concentration of the transported metal particles and/or ions per volume unit, and on flow rate as a result of pore diameters, the surrounding material and its surface, and on hydrostatic pressure.*

Typically, groundwater travels through aquifers – which in essence can be compared to a hard sponge: the water has to force its way through the tiny pore spaces between rock, sand, soil, silt, limestone, etc. During this process involving friction, the interactions between electrokinetics

and microfluidics directly convert the hydrostatic pressure of water into electrical work. Electrically neutral liquids such as water have a microdistribution of electrical charges near to their surface because of a charged solid surface – this region is known as the electrical double layer and induces electrokinetic phenomena. Due to the presence of an electrical double layer at the liquid-solid interface, liquid flow through microchannels (= the pores) by means of an external pressure gradient can result in a convection current, known as the streaming current, and a streaming potential between two ends of microchannels due to the accumulation of ions or charges. The more movable ions present, the larger the streaming currents that can result. This effect is known as an "electrokinetic microchannel battery" as proposed and experimentally proven by Yang and colleagues of the University of Alberta, Canada (19). At places where the groundwater flow changes its direction, an electric respectively magnetic field similar to that of a current-carrying coil is generated. Dowsers often use the confusing term "water vein crossings" to explain this effect. However, in certain cases, some sort of crossings of aquifers can be present. If this is the case, two or (in very rare cases) even three streams of groundwater are present, flowing in different layers and sometimes also different directions. Such aquifers are then usually separated by impenetrable material such as stone or clay. In such cases, adverse effects can multiply.

In addition to the above, the dipolar nature of H_2O-molecules could also be part of the origin of natural EMFs originating from the ground. As an extremely dielectric medium, water favors the formation of potential vortices, which contract swiftly immediately after their formation. When turning a water molecule with its electric charge distribution, a magnetic field results from the moving charge. If this is present in a pipe, a hydrodynamic flow vortex will be produced, with an electric and a magnetic vortex, a potential vortex and the corresponding eddy current (6).

2.2. Piezoelectricity

Piezoelectricity is the ability of certain crystals and certain ceramic materials to generate electrical and magnetic signals in response to applied mechanical stress. In nature, piezoelectric discharges can occur in some areas of geological "warps" containing quartz sand particles, and may be another plausible cause of geopathic stress effects (20). The effect was already discovered in 1824 by David Brewster and then

experimentally elaborated by Pierre and Jacques Curie in 1880. Although also present in tourmaline, topaz, cane sugar and Rochelle salt (sodium potassium tartrate tetrahydrate), the effect became particularly known for quartz. With a proportion of 12 % of the upper Earth's crust, quartz is the most frequent mineral after feldspar.

Inside an ideal quartz crystal, the electrical charge of the elements silicon and oxygen cancel each other out. When a crystal lattice cell is compressed by mechanical pressure, an imbalance is the result, manifesting itself in the development of a tiny electrical voltage *(Fig. 2)*. *Vice versa*, quartz can be triggered to oscillate by applying a voltage to it ("quartz oscillator crystal"; in use for example in crystal controlled clocks).

Another well known use of piezoelectricity is found in lighters using piezoelectric ignition: There, sudden mechanical pressure onto a synthetic quartz crystal block (containing high amounts of exactly aligned synthetic lattice crystal cells) leads to the generation of high voltage. The resulting spark is able to ignite the burnable gas. It is understandable therefore that sudden or variable heavy mechanical pressure on a great many of quartz crystal particles, as continuously present in many places of our Earth's skin, is able to create discharges of remarkable size (for reasonable overview, see also http://en.wikipedia.org/wiki/Piezoelectricity and other Encyclopedias).

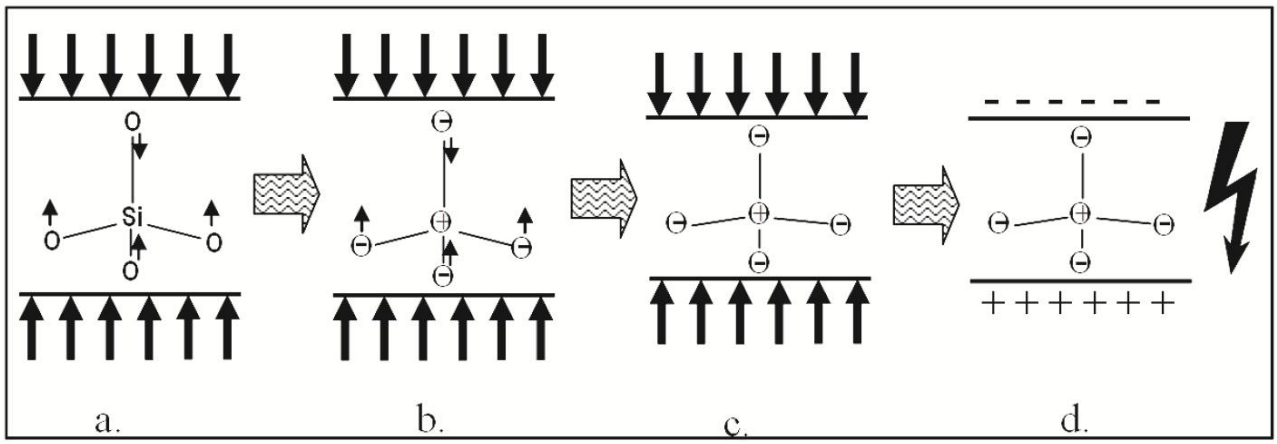


Fig. 2: *The piezoelectric effect is caused by movement of ions in crystals with non-symmetric elementary cells. While contracting (as shown in a.), the ions in every elementary cell are displaced (b.), thereby causing a drift of the gravity center of the negative and positive ions, relative to each other (c.). This leads to electrical polarization. As a result of the regular crystalline structure, these effects intensify so that they develop an electrical "difference of potential" between several*

surfaces of the crystal (d.). Source: http://www.thch.uni-bonn.de/pc/bargon/sensorik/Piezoelektrizitaet.html, with kind permission of Prof. Joachim Bargon, Institute for Physical and Theoretical Chemistry, University of Bonn, Germany. (Slightly modified scheme; Hacker 2011).

2.3. Scalar Waves

Another aspect of the geopathy phenomenon, possibly underestimated in its importance, might be found in the presence of "longitudinal scalar waves" (6). According to Konstantin Meyl (Furtwangen University, Germany), those are directed waves spreading into the direction of a field pointer. The scalar wave is carried by scalar particles or field vortices. In the case of plasma waves, they are charged particles, and in the case of sound waves, they are air particles. In 1904, E.T. Whittaker showed mathematically that the known and accepted Laplace Wave Equation of the year 1787, besides indicating transverse electro-magnetic waves, also describes longitudinal scalar waves (21). The existence of longitudinal wave proportions, as also present in the near field of a dipole antenna, has already been indicated experimentally by Nikola Tesla (1856-1943) (22-23). In spite of the fact that scalar waves in the field theory of Maxwell are usually neglected and set to zero, numerous experiments can lead to the conclusion that they do really exist and influence the human organism (6). Konstantin Meyl explains that to a measurement technician, scalar waves experimentally manifest as (antenna-) noise, a mixture of frequencies and wavelengths. They would interact with an appropriate partner or medium by going into resonance (6). However, we would also like to mention that most physicists doubt that scalar waves do really exist; the topic is therefore to be understood as highly controversial.

2.4. Natural Radioactivity

As a matter of course, natural radioactivity also plays a role in the geopathy phenomenon: often it exists in areas with a lot of granite and gneiss, and in zones where radon gas is present (e.g. thermal springs etc.). However, an extensive discussion of the origin and effects of radioactivity from the ground would go far beyond the scope of this manuscript.

3. REGISTRATION OF "GEOPATHIC INTERFERENCE" IN THE ORGANISM

3.1. Physical Interactions and Resonance

To influence an organism, an extrinsic energy source has to come into interaction with the body, organs, cells, organelles and/or molecules in some way or another. The presence of pure physical interactions and in addition also of "physiologic sensors" located inside the body can be assumed. Below we will go into detail on their possible interactive nature.

Physically, for instance, we could point to a reciprocal build up by resonance. Outside our body, "extrinsic" (external) field sources (e.g. those from the ground) are present. Inside our body, there are the "intrinsic" (internal) structures and molecules of the organism which either "resonate" because of their physical nature (as with stringed instruments: compare the vibration of the string alone *versus* string mounted on a resonator sound box, such as the body of a violin), or create a certain frequency themselves. Examples for the latter are the physiological "pace making" of the heart muscle, or that of the central nervous system (e.g., the 10 Hz-clocking of brain waves).

Physical resonance is defined as a synchronization of two sources which vibrate with the same pulse frequency but with contrary polarity. Energies are transmitted and a component of balance between the sources is being formed. Water plays an important role in physiological functionality of the organism and therefore also in the context to geopathy: The above discussed amplitude vibrations of the electrically charged potential vortexes associated to the dielectric water molecules are likely to contribute to resonance of bodily and cellular water with different external fields (from personal communication with Dr. Angelika Schrodt, Furtwangen, Germany).

3.2. Physiologic and Biochemical Sensors

Besides the role of water inside the body, and with the understanding that the human head contains 70% water (care: not "simple" H_2O is meant here; it acts as solvent for many substances and at the same time represents a kind of "structured water" of a colloid nature), some sorts of "receptors" or "antennas" must be present in our bodies, reacting to

geopathic fields. Of the numerous possibilities, only some examples shall be mentioned here.

Proteins and most other bio-molecules are not at all "non-rigid" structures; in order to fulfill their functions, they possess the ability to dynamically change their shapes within certain limits. Internal protein dynamics can affect protein function through a variety of mechanisms, some of which are tautological or obvious in nature while others are subtle and remain to be fully explored and appreciated (24). Certain processes of proteins as parts of their 3-D conformation have the ability to oscillate or rotate. Such only a few nanometers sized processes have been discussed as possible sites of resonance induced by external EMFs, acting as "**Protein-Antennas**" (25). When experimentally irradiated by EMFs of frequencies in between about 1-2 GHz, they displayed a changing of conformation, respectively changing in their manner of oscillation, even when only very low field strengths had been applied (25).

Huge amounts of very tiny magnetic crystals (**Magnetite Crystals**) have been found in the human nervous system including the brain, and these could react very sensitively to the slightest changes in magnetic fields (26). Black dots on magnetic resonance imaging pictures (MRI) of human brain tissue led researches to the idea that these could be magnetic particles. From post mortem brains, magnetite crystals of a size of 50 nm could be isolated, and their magnetic field could be measured. The research was done in a special laboratory room that was completely shielded from the natural magnetic field of the Earth by tons of steel. Actual measurements were carried out using a SQUID-System. The magnetite-particles could also be visualized and further analyzed using a high-definition transmission electron microscope. The most exciting result of those experiments was that, most of the regions of the brain appear to contain about five million biogenous "single-domain" magnetite crystals ("nano-magnets") per gram wet weight on average, and the meninges (*pia* and *dura mater*) contain even more than 100 million.

The meaning of those magnetic crystals in humans remains largely unexplained. Evidence that these microscopically small magnetite particles would function for some kind of sensory perception has not yet been confirmed. However, speculations are that the presence of magnetite crystals in the human brain might be understood as proof of

a "submerged magnetic sensor", similar to that of carrier pigeons or whales, theoretically easing human orientation and direction – thus a kind of "relict of evolution". However, if they would really represent a relict, those particles would not exist in such high quantities. Magnetic particles in the brain could turn out to be one of the reasons why dowsing can work. In any case, magnetite crystals in the brain might be a hint to explain how (certain qualities of) geopathic energies may affect the body: Magnetite reacts more than one million times stronger to an external magnetic field than every other biological material. A recent article published in the *Annals of the New York Academy of Sciences* describes possible roles which magnetic ferrous amalgamations could play in neurological disease (27).

When analyzing possible effectors' sites of fields from natural and/or technical origin, it appears likely that **Cell Membranes** may also play a role. It has been experimentally shown that even low field strengths of low frequency as well as high frequency EMFs can lead to changes or disturbances of information transfer at the ion channels of cell membranes (28-29).

4. ADVERSE EFFECTS OF GEOPATHIC ZONES?

Even though in today's popular media, pseudo-scientific and quasi-medical reports on geopathy are presented to the public, no "peer reviewed" medical journal indexed in MedLine had published statistically firm and sound *provable* evidence of geopathic effects on humans until a few years ago. Previously described effects and explanations of the pioneers in this area (e.g., 1-2) unfortunately aren't available in the standardized, scientifically acceptable nor reproducible format required for peer-reviewed medical journals, but rather as monographs. Nevertheless, this doesn't lower their importance and relevance: Those pioneers in research on the geopathy phenomenon neither had the scientific-medical verifiability methods that are available today, nor was the time mature for such publications in the kind of medical journals we know today. Nonetheless, what these people achieved, their courage, and that of the publishers who rightly published their works, deserves high credits.

Our first concepts on how to address the geopathy phenomenon were based on the descriptions and personal discussions with the late Otto Bergsmann († 2004) and Alois Stacher (medical doctors, both from

Vienna, Austria) and carried out in close co-operation with members of *Geowave Research* (Hallein bei Salzburg, Austria). Because of the lack of "direct" physical measurement techniques for the doubtlessly existing "energy fields" at least partly originating in the ground, we decided to use the human body as an indicator. In our first approaches, methods from complementary medicine were utilized (kinesiology, heart-rate variability (HRV), etc.). Although successful in some areas addressed, the effects found did not have the high statistical significance required, and the methodology used was not a generally accepted one, guaranteeing medical relevance and reproducibility.

4.1. The GDV System and its Use in Measuring Geopathic Influences

Soon after, we came across the ***Gas Discharge Visualization*** (***GDV***) technology. Being fascinated by its ability to sensitively detect stress response, and also by the fact that this method is world-widely used for manifold applications combining "pure physics" with complementary evaluation, we could reproducibly show using this method that different zones above ground do exhibit different effects on the human organism. After a thorough reviewing process, the associated manuscript was published in the renowned peer-reviewed journal *Forschende Komplementärmedizin* (*Research in Complementary Medicine*) (30). A variety of experiments carried out after this, including the use of standard clinical, biochemical and psychological methodology, yielded convincing evidence underlining the validity of our initial GDV studies. The final paragraph of this chapter summarizes those follow-up studies.

The GDV-method of Prof. Konstantin Korotkov (National Technical University of St. Petersburg, Russia), as used in our work, delivers a number of sensitive and reproducible parameters (30-56). For us, the ***mean "Area-of-Glow" (Mean Glow Image Area)*** was the most useful approach to sensitively indicate stress responses. A highly valuable addition provided by GDV is the possibility to acquire "***Corona Diagrams***" from the individual allocation of the "corona" gas discharge from the different fingertips, following principles of the energy–meridian theory and of acupuncture. Using that particular aspect, we were able to indicate which organ systems of the body might be affected by geopathic stress. The accordant calculations and projections were done interactively using specific software for analysis, based on the e*nergy-emission-analysis* according to Mandel (57-58), the *Su-Jok-*

System of acupuncture (59) and clinical data of thousands of test persons from the St. Petersburg institute of Prof. Konstantin Korotkov.

4.1.1. Is GDV a Reliable Instrument for Measuring Stress?

The question may arise if it is really justified to use GDV for stress measurements. In addition to the promising data presented in numerous publications before, including our own, we carried out experiments to clarify whether GDV mean area-of-glow is a reliable measure of certain aspects of stress. Although not yet completed, results of our tests indicate that this is indeed the case: Parallel measurements of the diurnal time courses of GDV mean area of glow and of biochemical parameters collected from saliva (60-63) indicate that the diurnal curve progressions of GDV image areas and the levels of immunoglobulin A (IgA) go parallel, whilst another accepted parameter of stress, saliva alpha-amylase, progresses just the opposite to IgA and GDV. In other words, a higher GDV mean area-of-glow value appears to correspond to a higher IgA level (a finding that could be understood as a sign for lower stress or relaxation), and a lower GDV mean area of glow value might indicate higher levels of the stress-related parameter alpha-amylase and therefore higher stress (14, 53-54).

4.1.2. Specific GDV Setup Used for Measuring Geopathic Stress

To detect geopathic stress, we have followed the design of a randomized, double-blinded non-clinical trial (64-65), following the ethical guidelines of the expanded Helsinki Declaration (66). All test persons had been thoroughly informed about the GDV system and related safety issues, also including the fact that they may feel a slight "crawling" in their finger tips. Fifty-two voluntary test persons were measured at two locations, one of which has been identified by a group of six distinguished dowsers as a "geopathic zone" and the other area as a "more neutral zone". All persons were tested with and without the "*CA-Geowave*" device (Geowave-Research, Hallein bei Salzburg; www.geowave.at).

The exact test design as well as the way dowsers independently labeled the different zones in the laboratory test room, have been described in detail (30). Altogether, more than 137,000 individual fingertip GDV corona images were captured, interpreted by means of c*omputer-aided*

image analysis and analyzed in detail using bio-statistics. *Table 1* shows a summary of the experimental details and results obtained.

A *GDV Camera Pro* (http://new.korotkov.org/), specifically designed for high stability and reproducibility as required for scientific measurements, had been applied. In practice, to capture one "static GDV image", a very stable high voltage (10 kV, 1,024 Hz, square pulses) is pulsed on and off every 10 ms for a duration of 0.5 s. The electric field produces a visible gas discharge glow around the fingertip (Kirlian image). The resulting corona discharges were repeatedly recorded from each of the 10 fingertips of the test person. For image capturing, the *GDV Camera Pro* was connected to a notebook computer. Glow images recorded were digitally transferred using *GDV Capture* software (version 1.9.9.; 2004). For further calculations and analyses, the *GDV Meridian Analysis* and the *GDV Diagram* software (both with version no. 1.9.9.), and the *GDV Scientific Laboratory* software (version 1.1.5.) were applied.

During the experiments, the complete GDV system was mounted on a wooden trolley, in order to measure the effects of the two different zones in the laboratory room directly "on site" without moving the test person to another place. For each test person and test phase, 50 single static measurements were performed (each finger tip was measured 5 times each for 0.5 s). In addition, dynamic GDV images from both ring fingers were recorded; this was repeated 3 times at the end of each test period. In the specific setup for the static GDV images used in our study, the overall GDV image area values calculated are to be understood as arithmetic mean values out of 50 single finger GDV images in total per test period. In randomized manner, four test phases were examined: A "Geopathic zone", with and without a blindly mounted *CA-Geowave* device, and a "more neutral zone", with and without the *Geowave*. The device had been mounted or de-mounted in another room on an upper floor, and neither the test persons nor the examiners could see if the device was present or not. In order to minimize chronobiologic influences, the experiments were carried out only during forenoons; in that respect too, phase randomization in time was an important prerequisite (30).

Table 1: *Summary of geopathy experiments carried out using GDV, and results obtained (30).*

Number of Test persons:	N = 52
Gender distribution:	28 women, 24 men
Age distribution:	17 to 68 years; mean 44.2 years; median 46 years.
2 zones:	"Geopathic" and "more neutral" zone, non-persuasively labelled with black dots on the floor
4 phases:	Randomized change in between: "Geopathic" or "more neutral" zone, with and without the *Geowave*
Phase duration:	15 minutes each, test persons sitting quietly on a wooden chair in one of the two zones. At the end of each phase, whilst still sitting, GDV image captures
Placement of the *CA-Geowave*:	Blindly; horizontally mounted or de-mounted in adjacent room of the above story, at an angle of about 60° and in a distance of 8 or 11 m away from the position of the test person. Randomized change of sequence.
Daytime of tests:	8-10 a.m. or 10-12 a.m.
GDV-system and settings:	GDV Camera Pro. 10 kV, 1,024 Hz, square pulses. "Static images" (0,5 s) and "dynamic images (30 s). For static images: all 10 fingertip corona images were measured 5 times, at the end of each of the 4 test phases (i.e., after 15 minutes of each phase).
GDV software:	*GDV Capture* (version 1.9.9, 2004); *GDV Meridian Analysis* and *GDV Diagram* (both version 1.9.9); *GDV Scientific Laboratory* (version 1.1.5).
GDV parameters:	Main parameter: Mean glow image area (= mean area of glow). 50 single static measurements (each finger measured 5 times for 0.1 s after each test phase. Following this, dynamic GDV measurements for both ring fingers, repeated 3 times each (thus, measuring 3 x 2 x 100 single images, i.e. 600 images per test sub-period. The mean GDV image area is derived from the single areas of glow (number of pixels with non-zero intensity in each single corona image), calculated as the arithmetic mean of

	the sum of all single finger images captured during one specific measurement circle, divided by their number. A number of additional standard values of descriptive statistics were calculated, also including the standard error of the mean (SEM). Additional parameters referred to as complementary data: spatial fractality (fractal dimension of isoline of the image); images and "human energy field (HEF)" diagrams, i.e. corona projections and corona diagrams (whole body projections, and circular beograms).
Further statistic analyses:	Sigma-Plot 2002, Excel 2003. Mean M, median Md, standard deviation SD, range, normality testing, comparison to Gaussian curves, distribution-free and normal-distribution-related tests (u-test, and paired two-sample t-test for dependent variables.
Results: static GDV image glow area	More neutral zone, without Geowave: M = 10,152 px, SEM 190 Geopathic zone, without Geowave: M = 9,354 px, SEM 170 More neutral zone, with Geowave: M = 11,792 px, SEM 169 Geopathic zone, with Geowave: M = 11,393 px, SEM 160
Results: dynamic GDV image glow area (ring fingers only):	More neutral zone, without Geowave: M = 9,635 px, SEM 133 Geopathic zone, without Geowave: M = 8,780 px, SEM 113 More neutral zone, with Geowave: M = 10,722 px, SEM 118 Geopathic zone, with Geowave: M = 10,461 px, SEM 113
Results: GDV Image Fractality:	More neutral zone, without Geowave: M = 1,897, SEM 0.0036 Geopathic zone, without Geowave: M = 1,903, SEM 0.0030 More neutral zone, with Geowave: M = 1,896, SEM 0.0036 Geopathic zone, with Geowave: M = 1,895, SEM 0.0036

4.1.3. Safety and Reproducibility Issues

To gain reliable data, we paid careful attention to a number of issues influencing stability, reproducibility and safety (30, 36, 43, 50, 54):

Throughout the whole study, the very same individual GDV system was used. Before use, the GDV camera (kept inside the laboratory at constant room temperature) was switched on at least 30 minutes prior to measurement and careful calibrations were performed. Each test person was asked to thoroughly wash their hands using a pH neutral laboratory soap (using a type without re-fattening properties), followed by wiping the fingertips with alcohol. It was not allowed to use hand cream or lotion. The glass plate surface of the GDV camera was frequently cleaned using alcohol, and care was taken that none of the test persons had wet hands. Our volunteers were advised to keep their fingers still and relaxed during measurements and not to apply undue pressure when putting their fingers onto the glass plate at an angle of approximately 30-degrees to the instrument axis (34).

4.1.4. Biomedical Statistics

Raw data from the GDV image glow area and *fractionality* were thoroughly analyzed by the software programs Sigma-Plot 2002 (Systat; San Jose, CA, USA) and Excel 2003 (Microsoft; Redmond, WA, USA). In addition to the calculation of descriptive data (mean, median, standard deviation etc.), we carried out Gaussian normality tests and subsequently used the paired two-sample t-test for dependent variables to determine whether there are significant differences between the 4 experimental sub-period results. Two-sided p-values were classified statistically significant if they were < 0.01. A number of further statistical analyses were performed, also including non-parametric tests.

4.1.5. Concomitant Measurements

Sophisticated calibrated equipment was to scan and record possibly overlaying low and high frequency technical EMFs, potentially noxious acoustic influences, mechanic vibrations and a variety of additional physical parameters during the whole study period. The two measurement areas in the laboratory used for the experiments turned out to be indistinguishable from the aspect of technical fields and acoustic background noise, and the technical field strength and noise levels present were far below existing safety guidelines.

4.2. Results of GDV Measurements for Geopathic Influence

Distinct location dependencies were found *(Tab. 1)*: at the area dowsed as a possible “geopathic zone“, significantly lower values of the “area-of-

glow" parameter were detected than those obtained from the "more neutral zone" ($p < 0.0001$). The mean static GDV glow area obtained at the "neutral zone" was 10,152 pixels (SEM: 190), whereas at the "geopathic zone", lower mean pixel numbers of the corona image areas were found (mean: 9,354 pixels; SEM: 170). This lead us to the conclusion that geopathic zones have caused some form of stress in nearly all of the persons tested.

When the *Geowave* device was mounted, both locations yielded much larger GDV glow image areas: The more "neutral zone" gave a mean value of 11,792 pixels (SEM: 169), and the "geopathic zone" yielded 11,393 pixels (SEM: 160). Statistical significance of comparing the mean glow image areas obtained without and with the device was enormously high on both places examined ($p < 0.0001$) (30). Thus, the *Geowave* was able to de-stress nearly all test persons at both, the geopathic and also at more neutral zones tested in our laboratory.

Further analyses included evaluation of certain complementary medical parameters included in the GDV software package. We calculated corona projections ("human energy field (HEF)") (*Fig. 3*), whole body corona diagrams, and circular corona diagrams (*Fig. 4*). Many of the corona diagrams calculated indicated a weakening of the HEF areas corresponding to the immune system, the pineal gland (which might be understood as a sign for possible changes of melatonin production – a conclusion that meanwhile could be confirmed using biochemical analyses in milk cows; see below and also compare to 67-71), the cardiovascular, and the urinary system.

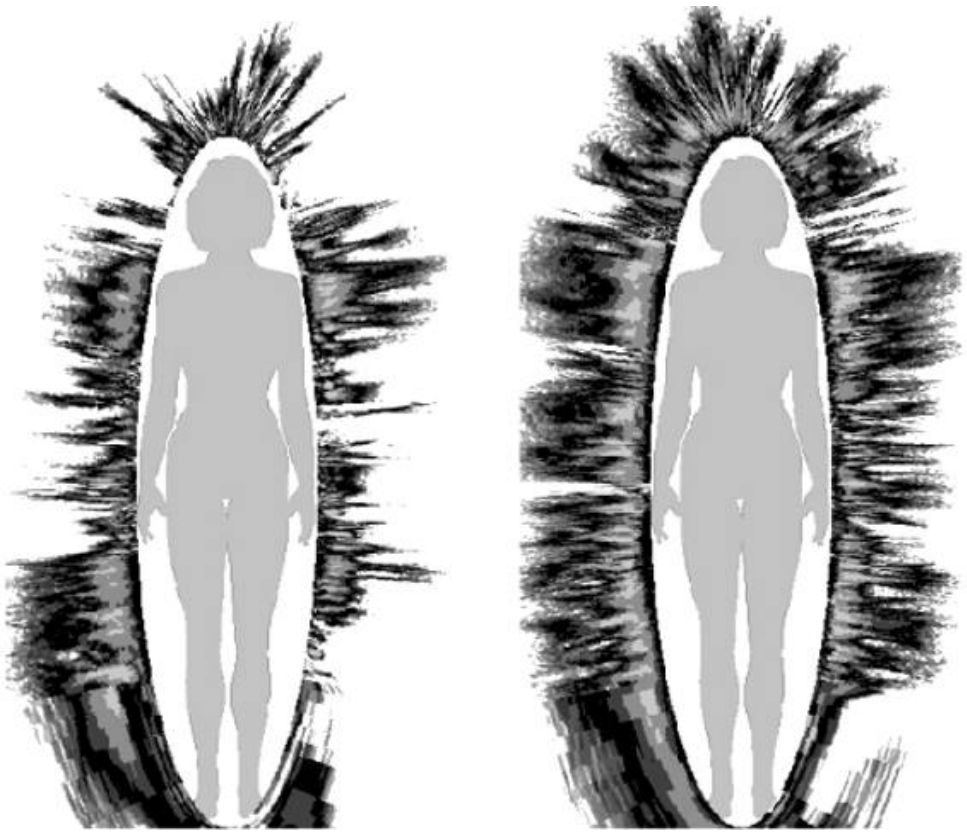


***Fig**. 3: Example pair of a comparison in between two corona projections (energy field images) of a female test person obtained on a "geopathic zone" without (left) and with the* Geowave *device (right) (www.geowave.at). The energy harmonizing effect of the* Geowave *is clearly seen: Whereas the left image shows energy deficits at many places, the right image shows a general increase and "smoothening" of the energy field.*

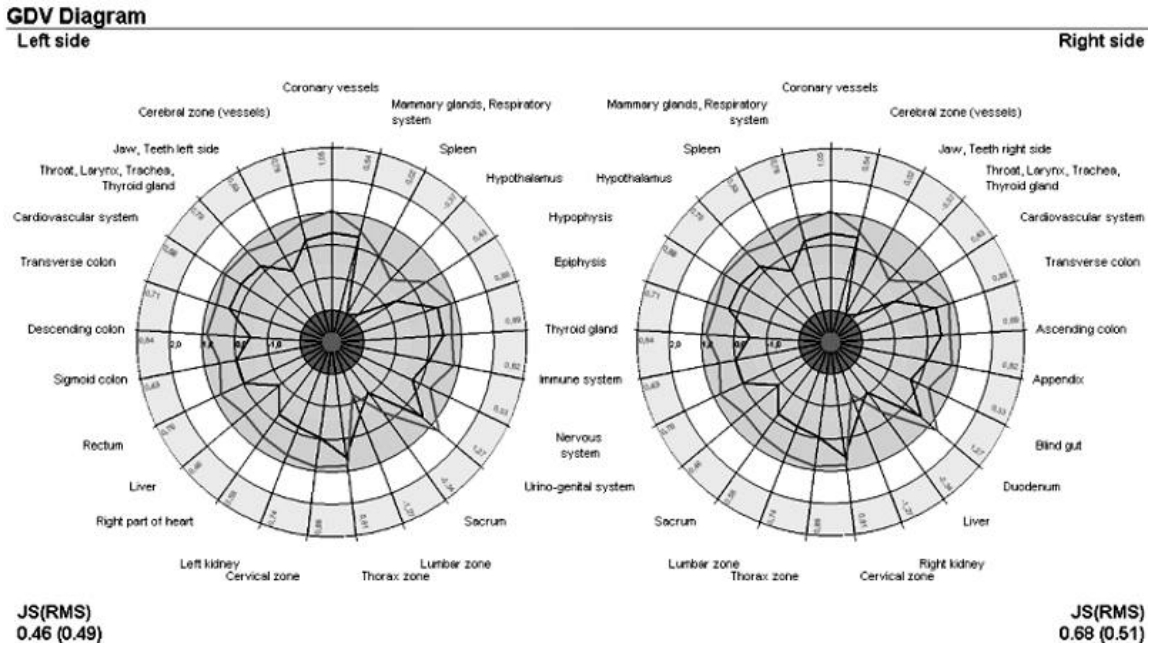


***Fig**. 4: Circular corona diagrams generated from the complimentary results of the test person already presented in Fig. 3. HEF projections comparing the*

situation obtained at a geopathic zone without (black curves) and with the Geowave *device (grayish, outer curve). A clear improvement of the whole energetic situation by the* Geowave *is evident.*

***Fig**. 5: Detail from the stem of a tree, growing in the Vienna Gardens of Schoenbrunn Castle. The abnormal growth appears to represent a kind of tumor. Such disorders can be frequently found when plants grow at zones judged by dowsers as being places of geopathy. Geopathic stress zones can, no matter if in plants, humans or animals, weaken the immune system by inducing stress. It has not yet been clarified if this might lead to the development of malignant tumors humans or animals. Such massive reactions*

at least appear to be a possible final outcome in those cases where chronic expression to severe geopathic stressors is a co-factor alongside with other kinds of immune-system suppressing influences. The development of tumor-like (adenoma-type) growth patterns in trees is a frequent phenomenon, although not yet studied by means of scientifically acceptable measures.

5. SIGNIFICANCE AND POSSIBLE BALANCING ACTIONS

Stress is known to adversely affect health as soon as it is present for longer periods (e.g., 72-76); it is then called *distress* ("negative stress"). Our GDV studies have given strong indication that certain areas above ground can induce stress. Even staying for as short as 15 minutes at such places can result in a stress response. Long time exposure has often been reported to induce sleeping problems. In the contrary, there are (non-scientific) reports that stimulatory places ("positive energy zones") might also exist. Sometimes, they are referred to as "power places"; pre-Christian cult sites are typical examples. According to geomancy orientated dowsers, such areas can be found within some churches and certain other buildings most often constructed centuries or even thousands of years ago. Under certain circumstances, "positive stress" (*eustress*) is a "wanted" bodily reaction, as it can stimulate us to best possible performance. However, if present for a prolonged time, even *eustress* may soon turn into *distress* and start to suppress our immune system.

Until recently, scientific evidence of stressing effects on humans sitting or sleeping at certain locations above ground had mainly been indicated by methods from complementary medicine (review: 77). Meanwhile, we have obtained a number of data underlining our results which in parallel, also validitate of GDV as a reliable instrument for measuring stress – provided that all pre-cautions are taken into account and that well-trained and experienced experimenters use it (54). Stress-related substances measured in saliva in parallel to GDV, such as immunoglobulin A (IgA), alpha-amylase and cortisol, showed diurnal courses expressing remarkable relationships to the GDV mean area of glow parameter (52, 54, 78). The existence of geopathic stress zones has also been underlined by use of psychological questionnaire methodology, which has shown that well-being is significantly compromised at such places (79).

In parallel, we have started performing experiments aimed to test key parameters contained in saliva and urine by using biochemical assaying

well accepted by orthodox medicine, such as certain hormones, neuropeptides and immunological relevant substances tested in a "non-invasive" manner. A presently limiting factor is that additional research budgets need to be available to perform the rather expensive ELISA tests on a larger scale.

5.1. Zurich and U.S.A. Cow Barn Studies

In 2010, the dissertation of Linda Furter dealing with possible effects of geopathic places on milk cows was published at the Veterinary Medial University of Zurich, Switzerland (71). Her studies showed a statistically significant adverse influence of geopathic zones on morning melatonin sulfate concentration in urine, and clear negative effects on milk quality, as reflected within the SCC parameter (somatic milk cell count) and other factors tested. Using modified *CA-Geowave* devices within the two stalls tested, significant improvements in the melatonin concentration (*Fig. 6*) as well as the SCC were obtained.

Somatic cell count describes the number of cells contained in one milliliter of raw milk and is a generally accepted measure directly related to udder health. Cells contained in milk derive from blood and glandular tissue; predominant cell types found are leukocytes, lymphocytes and macrophages. Various types of stress (such as heat stress) are known to increase the SCC. Generally a lower SCC indicates better animal health. Herds with a bulk tank SCC above 200,000 will have varying degrees of subclinical mastitis present, SCCs of above 250,000 to 300,000 show manifested udder inflammation, and values above 300,000 reflect severe mastitis. Healthy, but also younger cows express SCCs in between 20,000 and 150,000; such values are also often found in milk derived from organic farmers. When higher SCCs are present, milk yield is lower, and decreased lactate and milk fat values are also often observed. After mounting *Geowaves*, raw milk contained significantly fewer somatic cells (71).

In 2009, rather comprehensive tests in the U.S.A. on "problem-cow sheds" were started – so far in approximately ten medium sized dairy farms with 200-300 cows each. Those farms had a long history of major problems with the health of their cows so that the number of lymphatic cells in their milk had increased to high values, indicating udder inflammation (SCC; somatic milk cell count = number of lymphoid cells per milliliter of milk.) The reasons behind this were largely

unclear; practically "everything" had been attempted to improve the health of their cows. All farmers involved kept their cows in free range during the days while, during the nights, cows were allowed to move freely inside their barns, and hygiene in most of the stalls appeared to be high. At latest, 3-4 months after modified versions of "CA-Geowave" devices had been mounted within the stalls, significant improvements in milk quality, milk fat content, milk yield and overall health of animals were observed in two thirds of the farms. The investigations took place in close collaboration with David Reecher (Aquifers and Health Institute, Annapolis, Maryland, U.S.A.), with large Dairy Associations such as Dairy Lea, strictly following FDA (US Food and Drug Administration, Rockville, MD) guidelines, and in joint collaboration with the University of Wisconsin at Platteville.

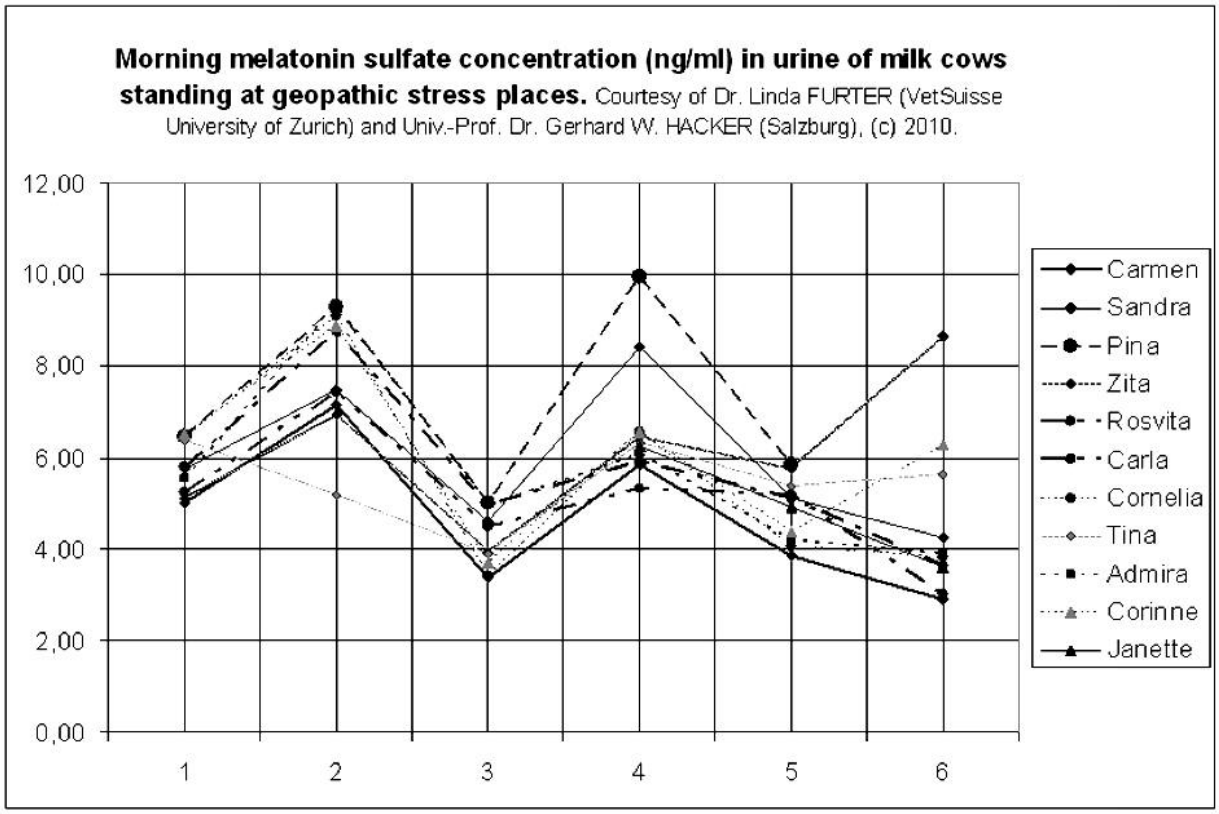
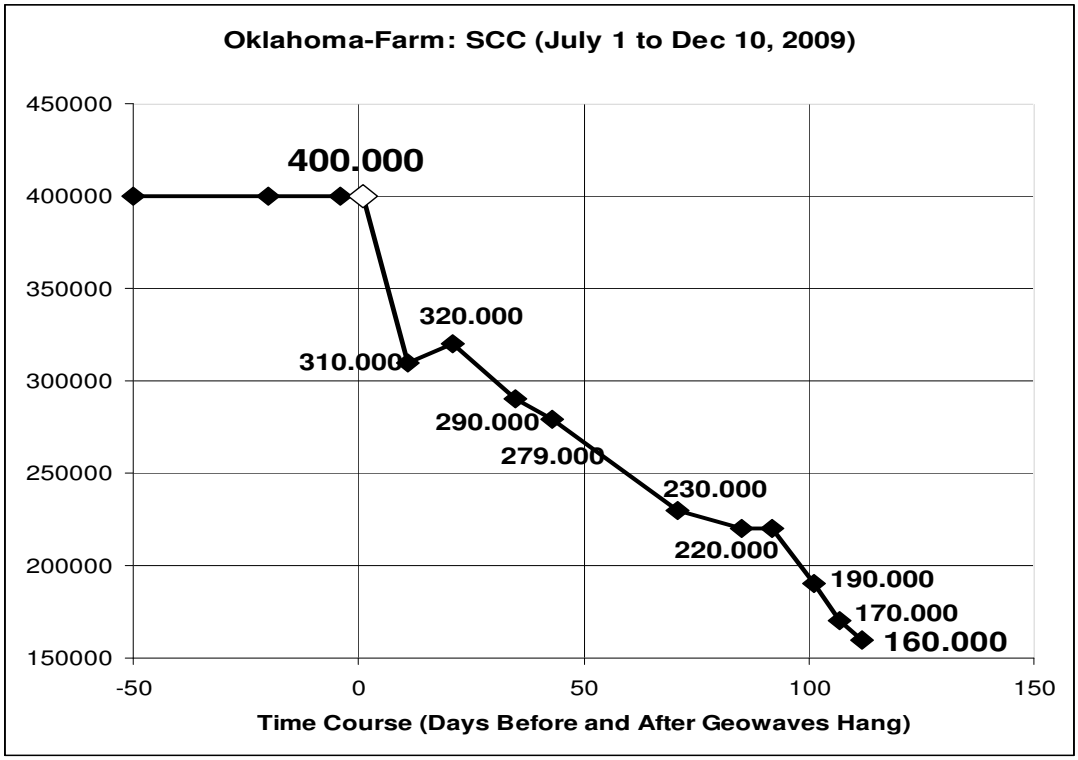


Fig. 6: *Time course of morning melatonin sulfate concentration (ng/mL) in urine of milk cows standing at geopathic stress places (71). Three sequences of two plus three weeks of "off/on" periods without and with* Geowaves *mounted are shown. I.e., X-axis data points 1, 3 and 5 show the results of measurements*

taken at the last morning after 2 weeks without the Geowave, and data points 2, 4 and 6 show the results obtained from the last morning of 3-weeks periods with mounted Geowave. *During the phases without* Geowaves, *melatonin levels at geopathic zones were far too low, whereas 3 weeks after mounting the* Geowave *devices, melatonin sulfate concentrations were back to normal within the second and the fourth period. A third off-on-pair of phases apparently stressed some of the cows, possibly due to several times repeated experimentation procedures; melatonin concentrations obtained at data point 6 therefore are rated not representative.*



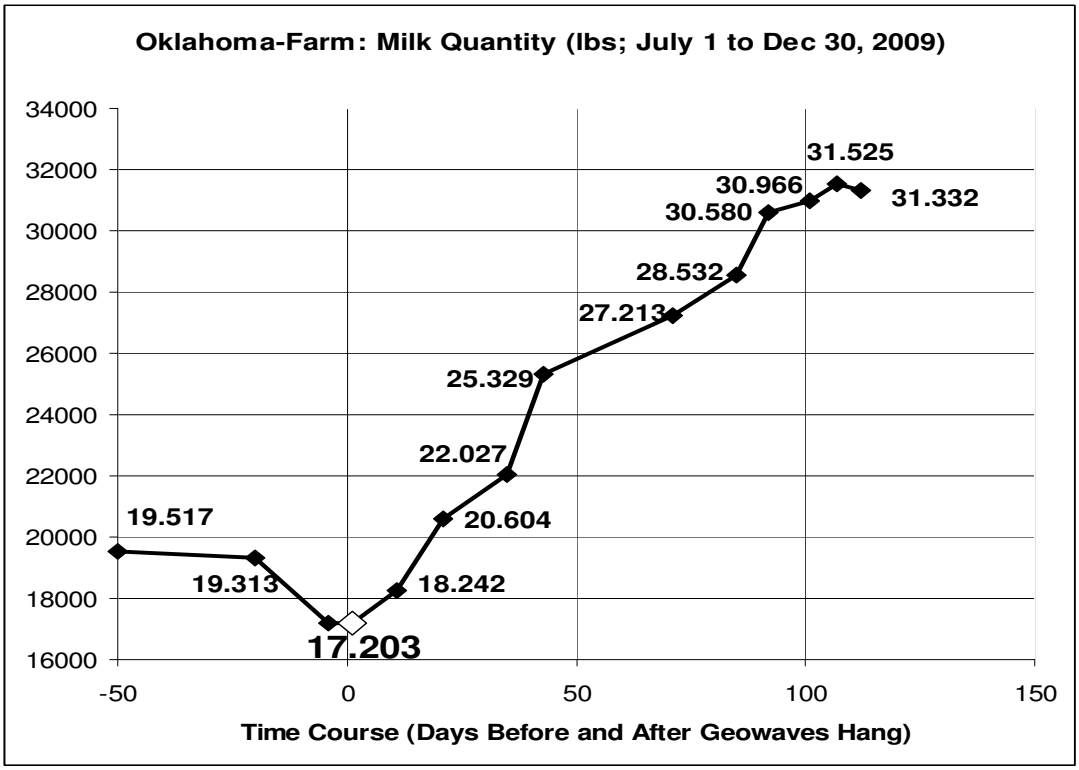


***Fig**. 7: Development of somatic milk cell count (SCC; number of lymphoid cells per mL of raw milk) and of milk quantity (expressed in American lbs) during 4 months after mounting six specifically modified CA Geowave devices within the barns of a milk cow farm situated in Oklahoma, U.S.A. (n ≈ 300 cows): Starting at 400 cells per mL milk, SCC under the influence of Geowaves went down to constantly obtained values of in between 150 and 180 cells per mL, and milk quantity, starting at about 17.000 lbs (equal to about 7,700 kg), increased to about 31.000 lbs (equal to about 14,000 kg).*

The chart pair shown in Fig. 7 is an example of outstanding results obtained in a facility in the U.S. state of Oklahoma. During the day, the approximately 300 cows of that farm were kept in generously large free-range land, while during the nights, the cows could move around freely within free-stalls. In addition to geopathic stress caused by two layers of geologically confirmed aquifers present in the ground beneath the barns, this farm is located in near vicinity of a high voltage power line and a transformer substation. As most of the other barns tested, those of the Oklahoma farm too featured a metallic roof which possibly showed unwanted charging effects as would be present in a plate condenser. Electric cables inside the stalls apparently were not built according to guidelines of construction engineers.

In the diagrams, the day on which six *Geowave* devices were installed are labeled with a white trapeze with black frames (= day 1). It can

clearly be seen that from that day on, the overall situation improved dramatically: Within about four months, the somatic milk cell counts in this example went down by more than 60 % (upper diagram), and in parallel, the amount of milk obtained increased steadily (lower diagram).

The adverse effects of stress zones and the harmonizing properties seen after mounting *Geowave* devices at such places detected in Swiss and American milk cows underline the validity of our earlier tests in humans involving GDV and biochemistry. In humans, meridian analyses with GDV indicated that geopathic zones can energetically weaken our immune system and various other bodily systems. The Zurich cow study showed adverse effects of stress zones on melatonin and udder health and also evidenced that overall cow health can be hampered when they stand above geopathic zones; this was seen both with higher incidences for mastitis, as well as for hoof and claw infections (71).

It appears highly likely that at least, in some human individuals, the development of disease is facilitated when people repeatedly stay for longer times at geopathic zones possibly present at their sleeping area and/or at the area where their working chair is usually placed. Effects of long term exposure on sleep quality, general health, healing processes (e.g. in hospitals or convalescent homes), well being (79), interpersonal relationships, and also on performance at work are possible consequences of location-dependent stress. People in early stages of compromised health may sense an added sensitivity for common cold infections, as well as notice that healing processes may take longer than usual. In later stages, it may not be impossible that chronic stress caused by geopathic locations may finally even forward the development of malignant disease. By its marked balancing effects, the *Geowave* device investigated in our studies can not only aid in lowering stress, but also as a tool for disease prevention.

5.2. Conventional Measures to Reduce Geopathic Stress

5.2.1. Constructional Possibilities

A number of effective “conventional” actions can be taken to keep one's body healthy and vital. Concerning geopathy, first of all, constructional adjustments are to be considered. Already in the planning stage of constructing new buildings, the geopathy phenomenon should be taken

into account, so as to consciously design and construct buildings and rooms in a manner that, in areas where people will stay for longer periods of time, geopathic exposure should be as low as possible. Within existing rooms, often a relatively little adjustment of beds and often used seats may contribute to better living quality and health (bedrooms / beds, offices / desk seats, living rooms / television seating; hospitals / sickrooms, surgical theaters, etc.).

As there are no reliable measuring instruments available so far, it makes sense to take advice from an experienced dowser. According to the Munich barn-experiments (80-82) and other independent investigations, only a low percentage of the people claiming to be successful dowsers are actually capable of making reproducible and reliable conclusions. We therefore recommend listening to the word of mouth to find an successful dowser.

If constructional arrangements are not possible before erecting a building or before starting a refurbishment, which is supposedly the case in most instances, there are also other practical possibilities: provided that there is a will to do so, it should be possible to move beds or desk seats, in order to get them out of interference zones. This is still the cheapest and a rather efficient action at the same time. For more information on Geopathic Stress, it is recommended to visit the website of the American *Aquifers and Health Institute* at www.aquifersandhealth.org

5.2.2. Stress Prevention

Everyone can do something to prevent negative influences by sources that cause stress: anything that lowers stress in general strengthens our body and therefore helps when geopathic stress is present. Possible approaches also include stress-management and relaxation techniques, such as meditation, tai chi, guided imaginative journeying, and certain hypnotherapeutic approaches (83-87). Likewise, prayer and spiritual practices can lead to improved inner harmony (88-89). Mental components are just as important: the more consciously someone lives, joy and positive thought orientated, the less psychic and somatic harm external stress factors can cause in this person.

Furthermore, many studies confirm that people who live healthy – paying attention to their body weight, refraining from smoking, enjoying the outdoors, performing sports, etc. – display a strengthened

immune system and definitely feel less stressed than their "unhealthy living" fellow men. A decisive component in this healthy lifestyle is, to what extent and type of nutrition one follows: concentrating on organically derived foods, eating lots of vegetables, fruit, and fish, but less or no mammalian or bird meat, as well as including periodic "purification" and/or fasting times, are some of the most important factors guaranteeing an improved health.

5.2.3. The *Geowave* Device

For those who cannot (or do not want to) adopt the above mentioned choices, due to illness, age or other reasons, things could become more difficult. Large numbers of experiments have shown that the *Geowave* device (www.geowave.at) has distinct harmonizing effects on the human and mammalian organism. In contrast, to our knowledge, no any MedLine-indexed and peer-reviewed publications for other claimed "devices for suppression of Earth rays / water veins" are available so far. Interestingly, the *Geowave* not only substantially reduces stress on geopathic places but also on "more neutral zones" – a finding which indicates that completely "neutral zones" do not really exist. One has to keep in mind that overlaying technical EMFs and various other stressors are present virtually everywhere on Earth. The *Geowave* device offers an exceptional promise as a general preventive measure of common interest.

5.3. Relevance for Everyday Life

Our studies show that it does matter on which location a person stays for longer periods of time. Para-scientific reports about sleeplessness or higher incidence of disease have been with us for many years. It is clear that an accumulation of different stress factors can have adverse effects on humans, animals and even plants. Possibilities to minimize the effects of geopathy on our organism in general have already been discussed above. In the following, we will give a brief overview on the potential relevance of the risk factor geopathy for health care facilities, public places, and the economy.

Fig. 8: *The* Geowave *is a sigmoidally bent device made of a specifically corrugated aluminum-magnesium alloy which is partly coated with pure gold. The device inherits a certain wavy macrostructure and a specific 3D-microstructure at its surface. Its greatest length measures about 60 or 80 centimeters (B- and C-type, resp.). To display its de-stressing effects, it has to be mounted underneath the roof in a horizontal position.*

5.3.1. Relevance for Healthcare Facilities

Vigilant physicians and nurses sometimes report that there appear to be certain locations of sickbeds in hospitals, convalescent homes and rehabilitation centers where remarkably many patients display a delayed recovery, or in especially blatant cases, may not even recover at all. However, it is often not possible to move beds in hospital rooms. Thus, for this practical reason it may be worth to consider installing a device that has a proven balancing effect. Experiences of up to eight years at the Salzburg Federal Hospital University Clinics (more than 100 *Geowave* devices have been installed there to harmonize critical locations such as the intensive care unit) and at other major hospitals in Austria (Vienna, Innsbruck), Germany and Switzerland indicate positive

influences on well-being and even healing. Remarkable effects against aggressive behavior have also been observed.

5.3.2. Relevance for Wellness-Centers

The term *wellness*, which is composed of the ideals *well-being* and *fitness* as well as *life-style* and *happiness*, to a modern point of view denotes a holistic concept of health. Wellness enhancing methods and applications aim to increase physical, psychological and spiritual well-being. An essential component is the so called *stress management*. The results of our research are of great relevance for wellness-centers: sustainable success in relaxation and stress management essentially depends upon the particular location of sleeping beds and therapy equipment. Such facilities, therefore, should be planned and managed consciously: When there are known interference zones of geopathic origin (and/or of technical origin too), such as underground water and springs, very soon this could have financial effects, because customers sharing word of mouth will tell everybody that the stay was only of moderate or no benefit to them. Thus, especially in already existing establishments, the purposeful placement of *Geowave* devices can be very helpful.

5.3.3. Aging and Anti-Aging Effects

It is likely that geopathy also plays a yet underestimated role in aging processes. Geopathy appears to be a major contributing factor to insomnia (Hacker, unpublished results). The Zurich milk cow study has shown that geopathic stress zones can lead to lower morning melatonin concentrations than those measured at geopathically unaffected places (71); it is likely that concentration and time course can be affected. In U.S.A., melatonin pills are an increasingly purchased miracle cure in anti-aging treatments. The Zurich study has shown that the *Geowave* is able to normalize melatonin levels of cows standing at stress zones – a finding that can explain why this device in humans leads to an improved sleeping quality. Another noteworthy finding in this context is an observation recently reported by a patient from USA who had

observed considerable improvements of her aging skin within a few months after a *Geowave* was hang in her house (Fig. 9).

Fig. 9: *The* Geowave *device appears to have remarkable beneficial effects on aging skin. The photos show the left hand of a 45-year old woman before (left) and 4 months after (right) a Geowave had been mounted in her house. The woman had been concerned about the appearance of her hands for years. She tried countless lotions and oils but nothing worked. During the 3-4 months after mounting the Geowave, the woman had noticed a gradual but significant change in her skin. Her hands became smoother, less wrinkly and more youthfully looking. The only thing she can connect this change to is the Geowave. (Reproduction with kind permission of David Reecher, Annapolis, MD, U.S.A.).*

5.3.4. Relevance for Public Buildings

Geopathy can significantly reduce well-being (79). Results of two unpublished pilot studies carried out by our team indicate that children sleeping, learning or living at geopathic locations might show more aggressive behavior. On-off-experiments during which *Geowaves* were installed and de-installed in randomized and blinded manners showed a distinct dilution of undesirable behavior patterns when *Geowaves* were present. Pilot tests conducted with twelve ten-years old boys in a care center for children displaying behavioral problems, showed that the incidence of bedwetting [nocturnal enuresis] decreased when the *Geowave* was present, and that the learning ability and the quality of sleep changed for the better. Remarkable improvements in interpersonal relationships were also observed.

5.3.5. Relevance for Competitive Sports

Impressive results have been reported from highly competitive sports. The motto, “winners slept better!” is of specific relevance in this area. A

serious athlete who doesn't sleep well before a competition is far from being as able-bodied as someone who has had "a good night's rest". Undisturbed individual beds, free from geopathic and other stressors, are enormously important. Unfortunately, the athlete usually cannot choose in which room or bed she/he will spend the night. Installation of *Geowaves* within exposed hotels and sports clubs would help to create a more equal base level for each sportsman. Alternatively, open-minded athletes could conceivably bring along a *Geowave* and use it in the hotel bedroom. As a CA-Geowave harmonizes an area with a diameter of 15-20 meters, this could benefit the entire team. A number of world champions in different disciplines of professional sports, and also members of a top class American football team have used the *Geowave* in this respect for years.

5.3.6. Commercial Relevance

Naturally, the negative effects of geopathic stress zones also have considerable commercial impact. Individual performance on interference-reduced zones increases and all sides - superintendents, managers and employees - would possibly benefit. When individuals sleep and feel better, they will perform better, be and stay healthier and happier at work too – facts that would also have economic consequences. The number of staff on sick leave will probably decrease in the long run, when all employees work at geopathically (and otherwise also) more balanced work places. Contrarily, at "highly burdened" workplaces, performance will decrease, discontentment grows, and the vulnerability to diseases and the resulting rise of employees' illnesses will be greater. The aggregate economic success of a company or institution can very well be in the balance; responsible (and visionary) managers should take heed of the results of our studies in their plans and act accordingly.

The follow-up costs associated with a prolonged (chronic) influence of geopathic stress zones are probably enormous: Geopathy burdened work places yield in a decrease of the employees' ability to concentrate on work, and to an increased probability of illness. Giant costs for economy and for social and health care systems are a more than likely consequence. Although geopathy is not the only cause of sleep deficits, it can at least be regarded as a very important contributing factor. Just recently, a study was published by a Canadian research team led by Meagan Daley (90). Insomnia is a highly prevalent problem associated with increased use of health care services and products, as well as functional impairments and a lot of suffering. The total cost of insomnia in the province of Quebec was

estimated at 5.3 billion U.S. dollars. Annual indirect costs associated with insomnia-related absenteeism were estimated at 778 million, with incredible insomnia-related productivity losses at 3.9 billion dollars!

6. Future Studies

To date, only short-term effects on humans have been examined using scientific measures. In parallel to our ongoing studies with animals, long-term studies on humans will be performed. These should include detailed analyses of the effects of geopathic stress zones on sleep, a larger biochemical test series on melatonin, and on economic consequences including testing the abilities to concentrate / perform at work when people sleep and/or work in places which contain stress. Another type of study to be performed should include analyses of long-term effects of geopathic stress on health and various states of disease, including cancer. However, this will only be feasible if innovative and generous sponsors are found. We therefore hope that our work will encourage many other study groups to begin scientifically founded studies in this new, but very important scientific area.

7. Summarized Results:

Geopathic Stress: Conclusions
• Using GDV, highly significant probability for existence of location dependency (short-term effect) was detected
• Geopathic interference zones weaken our organism
• They lead to stress; long lasting stress turns into chronic distress and disease
• Strong indication for weakening the immune system, cardiovascular system and others by geopathic influence
• Sleeplessness (insomnia): no relaxation, weakening the immune system and furthering aggressive behavior
• At home: avoiding or harmonizing interference zones help preemptively to stay healthy
• Health facilities: “healing" doesn’t work as well on geopathically burdened zones
• Wellness-centers /spas: Success of therapy and stress-management depend on location of beds, among others
• Schools, kindergartens, offices etc.: aggression and interpersonal relationships vary on location, among others
• Economy and work place: decreased performance, increase of probability of employee’s illness, follow-up costs

• Sports: "winners have slept better!"
• There is no real neutral zone, but only “better“, less burdened zones
• The *Geowave* device helps in nearly all cases: not only on geopathic zones, but also on more neutral zones, to de-stress the human organism

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