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A Review of the History and Scientific Bases Of Electrodiagnosis and Its Relationship To Homeopathy and Acupuncture

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Abstract: The use of acupuncture, homeopathy, and electrodermal instruments is increasing among physicians. This study presents a review of the history of medicine, the advent of electrodiagnosis and how it relates to acupuncture and homeopathy. Past and present research, scientific support and future possibilities are presented. Scientific concepts of holism and nonlinear physics provide a new medical paradigm, quantum morphodynamics.

I. Foundation of Western Medicine

A. Reductionistic-Mechanical Medicine. Through their willingness to examine chaos, wholeness and change, many disciplines of science are discovering a new and exciting world. Yet, Western medicine, especially as practiced in the United States, remains under the influence of the 17th century, Cartesian-Euclidean-Newtonian paradigm. This mechanical world view that provides the foundation for American medicine is a testimonial to three men: Francis Bacon, René Descartes, and Isaac Newton.

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Bacon (1561-1626) rejected the ancient doctrine of causes and professed only to accept laws derived from induction (observation and experimentation.[1] This did not prevent him from accepting certain causes based upon his own point of view. Bacon wanted to find a methodology for controlling nature.[2(p.224)] Descartes (1596-1650) declared the tool for mastering and controlling nature to be mathematics.[2(p241)] In Descartes' world, mind and matter became separate entities, providing a philosophical basis for the subjective-objective duality that has divided science into many separate fields of investigation with no unifying principle. Descartes gave doctors the "faith" that they could unravel the truths of nature and become its masters. Three dimensional Euclidean geometry led Newton (1642-1727) to his mechanics of three-dimensional flat space, with a separate dimension of time flowing in a straight line.[2(p.259)] His view was a world view for machines, not people.

The mechanical paradigm proved to be irresistible, leading medical doctors into a world strongly influenced by the philosophies of pure materialism. Locke (1632-

1704) helped to remove God from the affairs of people.[3] No longer was man to be considered as part of a divinely directed macrocosm, under the watchful supervision of a Higher Intelligence. Men and women became mere physical phenomena interacting with other bits of matter in the cold, mechanical universe. "The negation of nature," Locke declared, "is the way toward happiness." People must become "effectively emancipated from the bonds of nature."[3]

Although it should be obvious that such "emancipation" has not led to better health, it has provided the American pharmaceutical industry with whopping profits, $750 million a year from anticancer drug sales alone, not including the huge amounts of painkillers, antibiotics, and other drugs that are used by cancer patients.[4]

Since the 17th century, progress in medicine has been determined by the necessity to create a more ordered environment: "health" by manipulating the disordered natural world of the "sick" individual. Medicine, with its specialties and subspecialties, has become increasingly reductionistic and profit oriented in its quest to disassemble, assemble and manipulate body organs and parts. We shall present evidence that this reductionistic-mechanical point of view is losing its vitality because the foundation upon which it rests is becoming unstable and chaotic.

B. A New Medical Paradigm: Quantum Morphodynamics.

In living systems, energy is continuously flowing, entering the system at a high level and leaving the system in a more degraded state. Everything in nature is a unique transformation of electromagnetic energy, pure light, into a particular wave field which radiates its own special vibratory "signature."[5] People, living organisms, survive by being able to accumulate energy, or negative entropy, from the environment.[6]

Newly discovered laws relating to chaos or turbulence have signaled an end of the reductionistic program in science.[7] Scientists, including some physicians, are learning that simple systems give rise to complex behavior and complex systems give rise to simple behavior. A unified theory of nature that includes a description and interpretation of quantum mechanical reality brings together the concepts of fractals,[8,9] chaos,[10] and self-organization,[11,12] all of which are disciplines of nonlinear science which study common patterns in diverse systems. Nonlinear science, considered to be the interface between biology, physics, mathematics, and computing,[13] provides a formidable support base for bioenergy medicine that includes principles of homeopathy, acupuncture, and electrodiagnosis.

A secondary disturbance in the nonlinear wave of an individual by external electromagnetic application can be used to study biophysical medicine in general. Keeping the signals below a certain level will insure an absence of harmful effects. This effect can be obtained through the use of electrodermal biofeedback devices.

Today, electrodiagnosis is a bold attempt to shift the medical paradigm in the direction of modern science, which is now holistic in its understanding of universal energy, and away from the reductionistic-mechanical point of view. This diagnostic method was introduced into Western medicine as a "new science" by German physician Reinhold Voll[14] in 1953, and is often referred to as "Electroacupuncture According to Voll" (EAV).

II. Electronic Devices

A. History of Medical Use of Electricity.

Electrical currents have been utilized for centuries in the treatment of patients.[15] Scribonious Largus (46 AD), a Greek physician, used electric fish to treat patients with acute pain. The science of electricity probably began in England with William Gilbert in 1600. He established the difference between electricity and magnetism in his publication, *De Magnete,* and introduced the word, "electric."[16] Luigi Galvani discovered "animal electricity" in

experiments with a frog's leg and announced to the Bologna Academy of Science in 1791 that he had found the long sought "vital force."[17] Allessandra Volta, in 1800, claimed that electricity was not animal, but rather electrochemical in origin.[18] Both were partly correct and partly incorrect, as was later proven by Carlo Matteucci in 1830.[19] By the late 1800's, the use of electricity was extensive in various treatments.[20]

During the latter part of the nineteenth and beginning of the twentieth century, charlatans entered the scene in the United States, promising a multitude of false cures.[21] Even the leadership of the American Medical Association (AMA) was suspect.[22] In 1907, the AMA sponsored a survey of all the medical schools in the nation,[23] resulting in the Flexner Report in 1910. Because of the dominance of the reductionistic-mechanical model, electrotherapy and homeopathy almost disappeared from medical practice.

B. History of Electrodermal Devices

1. Oscilloclast: Doctors using electric instruments were quickly targeted for discipline in the early 1900's. Albert Abrams[24] invented an instrument for diagnosis and treatment that worked but could not be explained. The instrument, called an Oscilloclast, became known as a "Secret Black Box."[25]

Studying tubercular patients, Abrams discovered that they all demonstrated dullness to percussion of the abdomen when facing west, but not when facing any other direction. He found the same phenomenon when diseased tubercular tissue was brought into close proximity with the body of a healthy individual. When cancerous tissue was close to the body, an entirely different sound was elicited by percussion, suggesting that various diseases could be diagnosed by this technique and that disease appeared to have a vibratory quality as well as a physical appearance.

At first, a battery was used to operate the oscilloclast which was used to treat, as well as to diagnose. It consisted of four rows of dials with numbers: one for the "personal" or basic physiologic rate, a second for "intensification" of the personal, a third for fine-tuning into specific organs, and a fourth for the mental pattern behind the grosser physical symptoms which he called the "identification" rate.[26] Abrams believed each rheostat served to create a specially tuned resonant antenna which filtered out "noise" vibrations and allowed only frequencies that were in resonance with the patient to pass through.

2. Emanometer: Boyd[27] built a modification of the oscilloclast, called an emanometer, and his evaluation and treatment of patients became well known. Eventually, his instrument was investigated by his medical colleagues[28] who concluded that:

> ". . . certain substances, when placed in proper relation to the Emanometer of Boyd, produce, beyond any reasonable doubt, changes in the abdominal wall of the subject of a kind that may be detected by percussion. This is tantamount to the statement that the fundamental proposition underlying, in common, the original and certain other forms of apparatus devised for the purpose of eliciting the so-called electronic reactions of Abrams, is established to a very high degree of probability."[29]

However, since no one, including Boyd, understood how the instrument worked, it was impossible for others to repeat his experiments or do controls on his work after his death.[27(p228)]

3. De La Warr Instrument: In England, George De La Warr became interested in the findings of Abrams and Boyd and built his own instrument. He soon discovered that the instrument could work without a battery or electric power source.[30] All that was really needed was a dial that rotated an antenna made of a copper wire. He believed some other type of energy was involved, rather than electricity.

A co-worker, Christopher Hills,[31] described the instrument as being similar to the tuning of a radio, which does not need

an electric current flowing through it to be tuned to the proper signal. The only process that requires current is the amplifier, needed to increase the signal through speakers which in turn vibrate at rates detected as "sounds" by our nervous system through the auditory nerves. Tuning involved finding the position along the antenna which produced a frequency in resonance with the bioenergetic signal produced by the patient.

Hills believed these instruments were simply an extension of the consciousness of the operator, that the electrical apparatus was not important and the dial pattern "rate" simply served to focus the consciousness of the operator and patient. This concept has much more support from the scientific community today than when first introduced in the 1960's. All electrodiagnostic devices, with possibly the exception of the Motoyama device,[32] include the operator in the loop. Jahn,[33] in his research of this type of instrumentation, concluded that *intention* of the operator becomes the primary variable and that the device itself appeared to be the least important of all.

4. Neurometer: In the early 1950's, Nakatani[34] developed a device for conducting a 12 volt direct current through the skin of a patient, enabling him to discover that some points had a much higher electrical conductance than the surrounding sites. He called the lines connecting these conductance points "Ryodoraku" and noted the similarities between these points and the classical Chinese acupuncture points. The degree of pathology was determined by the difference of current flow between the points measured on the right and left sides of the body. Others have verified and substantiated the Nakatani findings.[35]

5. Dermatron (EAV): Being familiar with Chinese acupuncture, Voll and Werner[36] designed and built the Diatherapuncteur (Kraiss and Friz Co., Stuttgart), an instrument designed to chart and verify the relationship of acupuncture points to their corresponding organs and systems. Specific acupuncture points were charged with direct current of 8-10 microamperes (approximately 1 volt), resulting in a measurement of resistance[37] along an acupuncture meridian.

There are 361 classical acupuncture points on the skin surface of the body, situated at various locations along a system of 14 meridians, 12 bilaterally paired and 2 unpaired.[38] Voll not only verified the presence of these points, but discovered hundreds of new points.[39] Serendipitously, he observed subtle changes in resistance when substances in homeopathic dosages were introduced into the circuit[40] and became increasingly confident in his ability to diagnose and treat a variety of ailments. He and others have attracted proponents and antagonists in Europe and the U.S.[41,42]

The original instrument was replaced by the Dermatron, a modern, transistorized device, purported to be able to facilitate exact organ diagnosis by measurement of the momentary potential on an organ at the acupuncture point.[43] Leonhardt[44] has claimed that an exact diagnosis is possible using this instrument, although Voll[45] has stated that further clinical studies and laboratory tests are necessary. These claims are presently being challenged by federal and some state regulatory agencies.

6. Vegatest: Schimmel[46] developed the Vegatest device in 1978 and described the use of his instrument as "Bio-energy regulatory technique" (BER).[46(p9)] The BER measures the body's bio-energetic response (temperature, skin resistance, capacitance, biological fields, etc.) before and after stressing the body. For example, needling the Conception meridian (Ren Mo) two fingerwidths above the umbilicus at CV-10 (Xiawan), administering a piezoelectric impulse (400 volts/sec.), or electrical stimulation of the Governor meridian (Du Mo) at GV-25 (Duiduan) (at the superior edge of the upper lip on the median line) causes the body to react for approximately 15 minutes. Testing is conducted using a standard circuit for comparing resistances (Wheatstone bridge) using the Vegatest method. Measurements are made

at the following measurement points (either right or left): Allergy 1. or Triple warmer 1, or Connective tissue degeneration (skin) 1.

Some physicians have discontinued electrodiagnosis, feeling that results are too subjective.[47] Others have successfully defended the practice as part of their armamentarium for diagnostic evaluation.[48] Rather than being purely diagnostic, electrodermal devices provide the physician with a method for identifying imbalances within the electromagnetic circulatory system of the body, and aid in the selection of appropriate medicines and treatments necessary for a return to good health.

III. Scientific Support

Devices, which include the EKG, EEG and electromyelogram, are used routinely in modern medicine. In his research on L-fields, Burr[49] predicted the advent of other electrodermal devices and electrodiagnosis, from which voltage readings would provide the diagnostic clues.

Tiller[50(p.259)] believes that electrodiagnostic instruments offer a faster, cheaper and perhaps a more accurate method of diagnosis than the present chemical analytic methods.

A. Acupuncture: Skin resistance at acupuncture points is 50,000 ohms compared with 200,000 to 2 million ohms elsewhere.[51,52] In addition to their usefulness in therapy, acupuncture points appear to be information access windows, capable of providing data as to the functioning state of specific organ and body systems.[50(p.260)] Today, electrical devices are used by modern acupuncturists in many ways to aid the physician in diagnosis.[52] The body surface contains hundreds of points that can be utilized for accessing information about the dynamic status of the internal organs and systems, including important points found on the surface of the ear.[53,54] In the U.S., Becker conducted some of the earliest research, presented scientific evidence in support of acupuncture points and meridians, and suggested the need for further study.[18(p.339)]

Using Kirlian photography, Luciani[55] demonstrated the light emission diode (LED) effect of acupuncture points in 1978. Using a Tesla coil operating at 25,000 volts and 100 KHz at very low microamperage, he visually demonstrated the existence of electroconductive points along the Small Intestine meridian (lateral border of the 5th finger) and along the Large Intestine meridian (medial border of the index finger). Mandel[56] has used a similar technique in diagnosis and treatment of several thousand patients.

Motoyama[57] provided evidence for the existence of meridians, located in the water-rich phase of the dermal connective tissue. Darras[58] demonstrated the presence of meridians and points through the use of Scintillation 99m Technetium (TC) imaging of radioactive tracers obtained after subcutaneous injection of 0.05 ml of sodium pertechnetate. His findings support Motoyama's contention that the acupuncture circulatory system is separate from blood and lymph. Nordenstrom[59] discovered internal bioelectric circuits that work to balance the activity of organs and tissues of the body.

B. Solitons: The first description of unnatural waves in water was provided by Russell[60] in 1834, although such waves had been observed by others for centuries. Known now as solitons, these nonlinear waves are now being discovered everywhere in nature. The soliton is defined as a balance between the inward and outward diffusion of energy that results from nonlinear interactions binding individual sine waves together in nature.[61] Because the nonlinear world is holistic and interconnected, even a minute input of energy, such as succussion of homeopathic remedies, will result in energy accumulation and "memory" through coupling of feedback. When turbulence and chaos present a linear appearance of disorder, a nonlinear implicit coherence is occurring at the same time through soliton behavior. In living or-

ganisms, a soliton serves as a balance between the internal and external diffusion of energy. An electrical exchange that occurs in the giant nerve axon of the squid was described in the 1940's as a localized pulse traveling at a constant speed with an unchanging wave pattern.[61(p129)] These findings led to the discovery of neural "solitons."

Although the nerve impulse can be measured electrically, the impulse is not an electric current.[18(p65)] Electricity is known to travel close to the speed of light (186,000 miles/sec), whereas nerve impulses move much slower, approximately 32 feet/sec.[61(p120)] Solitons are nonlinear energy waves and transport information, allowing neurons to retain a memory of, and a sensitivity to, previously received messages. Very likely, solitons are the source of the mysterious "Chi" of classical Chinese acupuncture and the ever elusive "Vital Force" alluded to by Hahnemann[62] in 1810.

C. Electromagnetic Resonance (EMR) Studies: Benveniste, et al.,[63] provided scientific support for homeopathy with the discovery of strong intracellular activity in human basophils stimulated by very dilute antiserum against IgE (1×10^{120}). Degranulation activity was demonstrated when basophils were exposed to extreme dilutions of IgE (120x), leading the researchers to postulate that information must have been transmitted during the dilution/succussion process. Water was believed to be a "template," conducting the information via an infinite hydrogen-bonded network or electromagnetic fields. This revolutionary research nearly cost Benveniste his research position with Inserm,[64] the French equivalent to the National Institute of Health.

Gagnon and Rein[65] recently emulated the internal formation lattice of a homeopathic potency (200x) of the herbal extract, Aconite, through an application of time-reversed waves, non-Hertzian or scalar waves. Water exposed to specific frequencies, representative of Aconite 200x, resulted in a 100% stimulation of lymphocyte proliferation when compared with controls. The water retained its "charge" for 14 days.

Frequency resonance measurements have been made on homeopathic preparations as a function of potency by others. Ludwig[66] gave the principal frequency for Arnica 1000x as 9.725 KHz, and 300 Hz for Phosphorus 6x. Popp[67-76] has demonstrated the use of coherent light by living cells as being the carrier frequency for communication.

Allergy symptoms are similar to symptoms present in individuals found to be sensitive to electromagnetic fields. Monro[77] demonstrated the effectiveness of neutralization of symptoms in allergic patients through the administration of water previously treated through exposure to frequencies emitted by the allergenic substances.

D. Cellular Complexity: The complexity of structure within a cell is such that its potential molecular configurations or choices are virtually infinite. Cairns[78] showed that the DNA code within the cell serves as an exquisite feedback relay center. This balances the negative feedback ability with the positive feedback ability in order to amplify change needed in the "co-evolutionary process" (which sustains, transforms, and maintains life within the cell). Co-evolution refers to the kind of interactive influences that occur between two or more living organisms leading to a cycle of mutual causality. This type of thinking runs directly counter to the old scientific idea that nature evolves from the small to the large, from the simple to the complex. In harmony with the laws of quantum mechanics which govern the quantitative behavior of atoms and molecules, co-evolution on the micro and macro scale is a "fractal" idea where large and small scales emerge as aspects of one totally interconnected system. (Fractals—irregular shapes which have self-similarity at diminishing scales). Such thinking has led Nordenskiold[79] to postulate that life is a separate form of matter and Burr has supported this hypothesis. This concept provides strong support for the holistic medical paradigm.

Similar to the wave-particle duality of quantum theory,[80] each cell consists of a storage-memory duality. The genes carry the genetic code via an intermediate storage mechanism, memory. Holistic cellular memory contains information in a stable condition. As mentioned above, information is also imparted to the DNA through loops of feedback between the cell and its environment. The cell selectively adds this to the information coded in the genes from previous generations to allow the cell to choose those parameters best suited for its future survival.[81]

A process of creative selection occurs in a living cell by virtue of its "ordered coupling of energy."[82] Each cell transmits information non-mechanically from each generation to the next. The genes contain incomplete messages (symbols) that can be triggered by electromagnetic fields, resulting in complex biochemical activity. Cells can replicate themselves similar to their ancestors, selecting those wave patterns found to be ideal for the new generation.[82]

Embedded within the three-dimensional space of the cell are quantum potentials that can be influenced through resonance and harmony within the higher dimensional space composed of non-Hertzian (scalar, time-reversed, non-linear) waves.[65(p.1)] This may provide a key to understanding "The Law of Similars" in homeopathy. The energy and information of a homeopathic medicine are only available when the non-Hertzian frequencies of the medicine harmonically resonate with those in the cell.[83]

The basic cellular elements, carbon, oxygen, hydrogen and nitrogen, can be combined into an immense number of potential configurations by the cell. Choices from these configurations are made by the cell based upon its memory. No two cells are exactly alike, only similar. Williams[84,85] investigated the unique individuality of organs and tissues and concluded that modern medical treatment, based upon the concept that individuals can be "averaged" and treated alike according to diagnosed diseases, is inaccurate.

Physicians need to consider each patient as unique. Effective treatment will result when the individual is used as his own "control" during a medical examination. Electrodermal testing provides such a means for evaluating the individual. Medicines can be selected that match the mental as well as the physical state of the patient based upon information derived by means of biofeedback through the electromagnetic circulatory system.

A living cell contains processes that enable organic matter to go beyond mechanical determinism. Many organic molecules are highly polar, resulting in a separation of electrical charges within the molecules. In the water molecule there is a concentration of electrons around the hydrogen atoms and a deficiency of electrons near the oxygen atom, making it a very strong dipole.[86,87] Intracellular protein molecules show similar electrical properties. Organic molecules can induce a charge of the opposite sign in an adjacent molecule through the phenomenon of electrostatic induction.[88]

A living cell is known to be dielectric with very high electric field potentials (ten million volts per meter) across the cell's membrane.[17(p56)] Lakhovsky[89] produced oscillatory electrostatic waves by using a Tesla coil to successfully treat cancer in 1931, based upon his concept that every cell behaves as a dielectric resonator. More recently, Cone[90] demonstrated mitotic control by altering the cellular transmembrane potential. Cells are capable of interacting with similar systems by means of electromagnetic resonance and harmony, and produce an oscillating circuit containing inductance and capacitance. Energy that is provided from an external source is only available at frequencies where the natural oscillations of the cell are occurring.

Plasma, electrically charged particles (ions) in a gaseous state, may serve as a source of potentially infinite energy for the cell.[91] Plasma is believed to effect the guidance of particles that can achieve

nuclear fusion. This may be the mechanism observed in the transmutation of elements inside body cells. Kervran[92] demonstrated that calcium doesn't necessarily strengthen the bones in conditions of decalcification, whereas organic silica does. F. Royal has successfully treated many patients with bone fractures by reducing their intake of foods high in calcium and supplementing with herbs found to be high in silica (Equisetum). The fractures were less painful in the early stages and healed approximately 30% faster when compared with patients treated with calcium supplements and a high calcium diet.

Jordon[93] proposed the theory that a single passing particle could trigger an avalanche type of discharge within the cell due to plasma-like instabilities in organic tissue. This sounds very much like the "butterfly effect" noted to occur on a larger scale by Lorenz.[94] These dynamics involve nonlinear waves that are present at the interface of two or more electromagnetic fields or media (turbulence or chaos). This may provide a scientific explanation in support of the claims made by homeopathic physicians; namely, very large changes can occur through the application of infinitesimally small amounts of a substance whose electromagnetic frequencies are in resonance with the cells of the individual being treated.

E. Research

1. Allergy Testing: Unpublished research conducted at The Nevada Clinic from 1980 to 1982 revealed electrodermal allergy testing with the Dermatron to be superior to all other testing modalities in use at that time. In 1984, six diagnostic modalities for assessing food allergies, one being electrodermal testing using a Dermatron, were compared by researchers from the University of Hawaii.[95] The authors concluded that the electrodermal (EAV) data obtained demonstrated a high level of correlation with the food challenge test, considered to be the most sensitive of the currently available diagnostic techniques for food allergy.[96] In addition, EAV results were comparable with both Skin and RAST tests.

In 1987, Fox[97] did a similar study using the Schimmel Vegatest device. The Vegatest electrodermal method was reported as being fast, accurate and as effective as any other method currently in use for finding allergy hypersensitivities. Testing also proved to be reliable for determining the neutralizing points in preparing complex allergy serums for individuals.

Other double-blind studies have been done evaluating hypersensitivities using this technology. In 1989, Ali[98] performed a double-blind test comparing the results of IgE antibody levels (micro ELISA procedure) for a variety of pollens and molds to electrodermal testing for the same antigens. There was a 73 percent correlation between the two tests.

2. Cancer Research: Kobayashi[99] successfully used the neurometer for the early detection of cancer via measurements of the acupuncture system. Although we do not presently understand how the electrical conductance and permeability selectivity values of the acupuncture points are directly connected to specific organ or body systems, nonlinear effects (solitons?) have been investigated by Fraden and Gelman.[100,101]

In 1985, researchers at UCLA and USC, using a Dermatron, demonstrated that the evoked electrical conductivity at distal lung acupuncture points was significantly different in individuals with lung cancer when compared with controls.[102] An 87 percent correlation between the testing results and the results of the x-ray diagnosis calls for further research in the use of electrodermal devices in early cancer detection.

3. Diabetes Mellitus: Tsuei[103] and a team of researchers at the University of Hawaii compared a diabetic population (33 males and 22 females) with a control group (43 males and 52 females) using electrodermal measurements. Measuring the Spleen-Pancreas number 3 point (SP-3, Taibai):

> "re-enforced the efficacy of discriminant analysis . . . which supports the validity of this method of evaluation . . . This

investigation showed that bioenergetic measurements such as EAV can be effective in the diagnosis of diabetes. Because of its sensitivity, reliability and specificity, EAV can serve as an extremely valuable new diagnostic tool in medical practice."[103(p38)]

Continuing their research in diabetes, 55 established diabetic patients (33 males and 22 females) were evaluated in 1990.[104] They found that the proper doses of glyburide, chlorpropamide, and NPH insulin did not relate to the fasting blood sugar, but did relate to the well-being of the pancreas. The latter could be determined via electrodermal testing of acupuncture points. The researchers concluded:

"The bioenergetic method of medicine testing has the capability of enabling the identification of optimal dosages of medicines and of evaluation of drug effects on organs even before they are prescribed and taken by a patient."[104(p133)]

4. Other Research: In 1988, Tsuei, Lam and Mi[105] found significant differences between males and females, among age groups and testers in regards to general body energy distribution when testing was performed with the Dermatron. In Germany, Rossmann and Popp[106] evaluated the relationship of the "indicator drop" of the Dermatron, utilized in EAV to determine the seriousness of disease. They found significant correlations to the kind and the seriousness of the diseases evaluated in arbitrarily selected groups of patients.

IV. Office of Technology Assessment

Considerable controversy exists in medicine today over the issue of which techniques are considered "experimental," and which ones are considered to be adequately proven. The Office of Technology Assessment (OTA) of the Congress of The United States produced a lengthy report entitled "Assessing The Efficacy And Safety Of Medical Technologies."[107] The report stated:

"It has been estimated that only 10 to 20 percent of all procedures currently used in medical practice have been shown to be efficacious by controlled trials . . . Personal experience is perhaps the oldest and most common informal method of judging the efficacy and safety of a medical technology."

The OTA publication further states:

"It is important to point out that many medical advancements have properly and successfully proceeded without rigorous statistical methodology of evaluation . . . two points that summarize the utility of informal methods (are): (1) despite complexity, and cost, some procedures are so effective in restoring function that few would question their social utility, and (2) . . . for a disease for which the natural history is fairly well known and the benefits of a new technology are dramatic, alternative methods of evaluation (as compared to controlled clinical trials) may be appropriate."

V. The United States Food and Drug Administration (FDA)

The FDA has decided to take action against some of the users of electrodiagnostic instruments until safety and effectiveness have been established.[108,109] As a biofeedback device, an electrodiagnostic instrument would be registered by the FDA under its Document of Devices, Sub-part F, No. 882.5050:

"A biofeedback device is an instrument that provides a visual or auditory signal corresponding to the status of one or more of a patient's physiological parameters. That is, brain wave, muscle activity, skin temperature, skin resistance, etc. The patient can control then, voluntarily, these physiological parameters. Biofeedback devices are Class 2 performance standards."[110]

Some of these instruments, such as the Dermatron, have treatment modalities as well as diagnostic capabilities.[111] Past experience indicates that biophysical therapies which treat illness by applying energy in various forms to the body will gain acceptance by the FDA only when they can be explained in a manner acceptable under the

present medical paradigm. For example, bone growth stimulation has received FDA approval because bone growth is known to be controlled at least in part by piezoelectricity.[112] Yet, it is unlikely that any of the currently used treatment devices involve the piezoelectric mechanism.

Transcutaneous Electric Nerve Stimulation (TENS) devices have been approved for pain relief by the FDA because of the gate-control hypothesis,[113] coupled with the ability of these devices to stimulate action potentials. This provides a conventional explanation acceptable under the current medical model. However, further investigation has indicated that this hypothesis is not a satisfactory explanation.[114,115]

The FDA is an agency that is largely set up to evaluate food and drugs in terms of chemistry, biochemistry and molecular biology and it has personnel with these kinds of background. Because of its strong ties with the medical community and with the pharmaceutical industry, the FDA may not be staffed with the proper personnel to evaluate new data in the highly interdisciplinary fields emerging under the heading of bioenergy medicine.[4(p4-417)] Evaluating data in energy medicine demands training in biophysics, engineering, photobiology, membrane physiology and now, quantum chaos.[116]

Below are additional examples of the reductionistic-mechanical posture of the FDA:

1. Although observations of electrical changes that accompany injury and healing have been observed since the 1920s, there are still no therapeutic devices for the treatment of wounds that have been approved by the FDA.[117]
2. During the past 8 years, the FDA has chosen to ignore research into the effects of light on biological systems, even though 15 separate biological functions have been shown to be influenced by low-power laser light.[118]
3. Today, there is significant evidence demonstrating the validity of the acupuncture points and system,[38(p253-272)] yet the FDA considers acupuncture to be an experimental procedure. Forty seven states in this country recognize the value of acupuncture and have enacted laws to regulate its use by qualified practitioners. The position taken by the FDA is puzzling, assuming it is for reasons other than protecting and supporting the present medical and pharmaceutical industries.
4. Other treatments such as Laetrile, considered illegal by the FDA, have also been legally approved for use by several states, Nevada being one of them.

The action taken by various states in opposition to the FDA demonstrates a lack of confidence in this federal agency.

Even when found to be safe and effective by practitioners, medicines and devices whose scientific support comes from physicians and scientists who are not within the framework of the present medical-pharmaceutical paradigm are usually rejected by the FDA. Burzynski[119] found a naturally occurring substance in the urine of healthy individuals to be highly effective in controlling cancer. Yet, he was repeatedly denied an IND [investigation of new drug status] by the FDA to do controlled studies from 1983 until 1989.[4(p287-338)] Remington provides us with some insight as to how regulatory authorities view electrodiagnostic instruments:

> "According to a colleague in California, a state official pronounced that he had proven that the use of electrodiagnostic instruments is pure quackery, because he had personally tested one out that he had confiscated from a local practitioner, and showed conclusively that it didn't work."[48(p10)]

Physicians and those employed by state and federal government need to clearly understand the role of the FDA as a regulatory agency. The *FDA does not approve or disapprove* of how a legally marketed instrument or drug is used by the physician in

his practice.[120] The FDA does approve what the manufacturer may recommend in its labeling and advertising about uses of medical equipment.

VI. Nevada Statutes

The Nevada Revised Statute (NRS) 630A.350(4) requires the Board of Homeopathic Medical Examiners to initiate disciplinary action when a physician is "advertising the practice of homeopathic medicine in a false, deceptive or misleading manner."[136] If a complaint were filed against him, a physician claiming to diagnose a patient solely by means of an electrodermal device in the absence of other supportive evidence might be in danger of disciplinary action by the board.

VII. The Future of Electrodiagnosis

Electrodermal instruments have been around for most of this century and have been widely used throughout the world during the past thirty five years. Instruments are presently manufactured in Germany, Japan, China, France, Russia, Korea and in the United States. These instruments are not perfect; most are operator dependent and should not be relied upon as the only method used in diagnosing a patient. The value of uniting other diagnostic procedures with these instruments, such as spectrophotometry, is presently being explored at the Nevada Clinic and opens a completely new approach in solving medical problems.

Probably no other electrodermal instrument has been utilized in diagnosing patients more than the electrocardiogram (EKG). A "stress EKG" [stress test] is considered by doctors to be more reliable than a "resting EKG." Yet, some of this country's foremost cardiologists call the stress test "no good."[121-123] Textbooks on the use and application of the EKG warn the doctor:

> "Rarely is a diagnosis made entirely on the existence of EKG findings . . . Although it is an extremely valuable clinical tool, the EKG has inherent limitations because it reflects only the electrical activity of the heart. The importance and value of the EKG have tended to be overestimated by lay and professional people alike."[124,125]

Those who manufacture electrodermal instruments, along with those who author books and manuals on their use, need to exercise restraint in making claims that have not been supported by appropriate scientific data. Just as a diagnosis cannot be made with an EKG machine, it cannot be done with any other electrodermal testing device. Disclaimers in regard to making a diagnosis with these devices should accompany each instrument.

VIII. Present Medical Crisis

The world is presently experiencing a medical crisis. The war on cancer that began on December 23, 1971, when President Nixon signed into law the National Cancer Act, has resulted in more than $25 billion being spent on cancer research.[126] Yet, one out of every three Americans living today will develop cancer, and one in five will die as a result of this chronic epidemic.[127] Having lost the cancer war, orthodox medicine is now losing the war against a wide variety of chronic diseases. Taxpayers invested $500 million to defeat cancer in 1973; the tab in 1989 was $96 billion.[4(p.11)] *Medical costs were over $500 billion in 1989* and continue to increase at twice the rate of inflation.

Many of today's illnesses are *iatrogenic*, caused by the doctor or his treatment.[128] Approximately 36% of the patients in our hospitals today had an iatrogenic illness, and 2% of the hospital admissions died with iatrogenic illness being a contributing factor.[129] Senator Hubert H. Humphrey (D.-Minn.), a strong advocate of orthodox medicine most of his life, realized too late that the chemotherapy he received at Memorial Sloan-Kettering Hospital for treatment of his bladder cancer was "bottled death," as he called it.[130] He died

15 months after his surgeon boldly declared to the news media, "the Senator is cured."[131]

As people become aware of the suppression and distortion of information that directly affects their health (cancer statistics, adverse effects of electromagnetic fields, adulteration of food, etc.), they are increasingly thrown into action against it, i.e., suing doctors; suing companies; signing petitions and protesting. Millions of people have lost faith in their doctors and in government, and are demanding alternative forms of therapy. However, there is no need to exaggerate the scope of this rebellion. All of the necessary ingredients are now present in medicine to bring about a revolution greater in magnitude than at any other time in history.[16(p.28-39)]

Orthodox medicine's problems have existed for at least twenty years, based on an assessment made by a National Academy of Sciences panel in 1973:

> "What is most urgently needed for problems of this kind is an abundance of new ideas, and these are most likely to emerge from the imagination and intuition of individual scientists. It is much less likely that the administrators of large programs . . . at the center of a highly centralized bureaucracy can generate the kinds of ideas that are needed."[132]

Ninety percent of the patients seen and treated at the Nevada Clinic in Las Vegas, Nevada, are from other states and countries. Most of them, or their insurance carriers, have already invested heavily with other doctors, clinics, or hospitals and have failed to respond to treatment. More than twenty thousand such patients provide evidence of the failure of the medical industry in its attempts to treat chronic illness. On the other hand, improvement in the health of these patients stands as a testament to the success of electrodiagnosis, acupuncture and homeopathy.

The Nevada Clinic has utilized electrodermal testing of acupuncture points in evaluating patients for over ten years. Electrodiagnosis serves as an essential part of a complete examination performed by physicians in our clinic. In some individuals who came to the clinic for evaluation, diagnosis and treatment, important information could not have been obtained by any other method.[133,134]

The arrogant attitude and lack of understanding of bioenergetic principles exhibited by American doctors today is a detriment to the health of many individuals and a hindrance to medical progress. These doctors are products of a medical education that "has remained essentially unchanged for 70 years."[135] Their patients are seeking help among holistically oriented physicians, some of whom utilize electrodiagnostic instruments.

IX. Final Remarks and Conclusion

Western allopathic medicine is founded and supported on the reductionistic-mechanical scientific paradigm that originated in the 17th century. Unlike Western medicine, science is becoming holistic, based upon quantum mechanics, new laws relating to chaos (turbulence), fractals and the discovery of self-organized criticality. Unified theories of nature incorporate non-linear science as an interface between biology, physics, mathematics, computing and form a foundation for bioenergy medicine that includes electrodiagnosis, acupuncture and homeopathy.

Electrodiagnostic instruments have been used as biofeedback devices to aid physicians in their evaluation of patients since the early part of this century. This technology has been studied, researched and used around the world by thousands of doctors from many countries. A few of the many studies, including a number of double-blind studies, validating this procedure have been presented. Electrodiagnostic testing has many advantages and should be utilized in every hospital and in the office of every physician who prescribes for his patients.

In conclusion, the necessary requirements for use of electrodermal in-

struments for electrodiagnostic testing have been fulfilled:

1. Double-blind studies from various centers validate its efficacy.

2. Experts in medicine and the allied sciences acknowledge its usefulness and accuracy.

3. Thousands of physicians have used this technology for many years to successfully treat their patients.

4. The instruments are non-invasive and free from any harm to individuals.

5. Other accepted medical procedures are much less proven, more dangerous and more expensive.

6. Federal (Documentation of Devices, Sub-part F, No. 882.5050) and State (NRS 630A.350(4)) laws are already in place for regulating the use of this equipment.

It should be obvious that singling out this procedure for investigation above other medical procedures is arbitrary, capricious and is for reasons other than a concern for the patient's health and well being.

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