Charge Distribution Networks (CDN) as Meridians

Utilizing conductivity as replacement 'structure' for meridians; comparison with neural, muscular, and fascial models

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ABSTRACT

Traditional Chinese Medicine and Ayurveda rely upon meridian systems which have not been scientifically accepted because they are not completely anatomical. Channels follow nerves, muscles, fascia, and the as-of-yet-unestablished primo-vascular system, but also perform many physiological functions which are systemic or macrobiotic. Rather than randomized, non-linear chaotic waves, CDN's perform the same functions as fractal continuums by being mostly one-way analog circuits, but they adhere to TCM's energetic theories. The concepts of excessive and deficient energy, and possibly of heat and cold, etc… can be treated as charge accumulations and signals that are meant to normally propagate in a linear direction, but with non-linear (recursive) self-regulation locally and distally. CDN's can be used to describe the higher order functions of nerves and the energy flow in vessels and muscles. A first version model schematic is provided, and after finer details are discussed, a number of methods for refinement, evolution of the model, clinical and lab testing and a simulation schemata are offered. The schematic partially functions as symbolic, but in other ways needs actual values found (or ranges of values), in order to refine it for a grander practical purpose. A small discussion of "pulse" (a TCM vital substance) illustrates the need, and provides a clear goal. The model is also useful for the discussion of strangeness or "Supernatural" issues which have been documented but never explained. It is a first step towards a signals' based, charge distribution network circuit model.

Key words: meridians - chaotic wave - fractal - charge - signal - analog - circuit

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Synopsis

In the author's previous work, "Clinical Electric Field Measurements,"[1] the author discussed the measurement of electric fields as a means for determining disease state (literally by measuring Ef at local and control sites). By utilizing acupuncture (and other TCM) modalities, it was demonstrated without doubt in three trials of different design and increasing control mechanism, that changes in electric fields occur during changes in self-reported pain/significance scale. Acupuncture (and TCM in general) relies upon the meridian and acupoint system to function as transformer of disease, to re-establish healthy homeostasis (such as metabolism, peristalsis, and reduced pain states), and promotion of longevity and health improvement induced states. The ratio of dE:dPx, that is change in Ef to change in pain scale during treatment, was always over 1:1 for local disease sites, and never over 1:1 for control sites at anytime, throughout all forms of control.

Moreover, interesting correlations were found between weather and other external environmental interference and clinical measurement, supporting TCM ideas involving the exogenous origins of disease and pain. Finally, there were interesting correlations that *may* have been uncovered correlating proton density in solar wind, with lunar phase and level of dPx during treatment, implying that the role of protons as charges within channels or meridians may be vital to diagnostics *and* to treatment of disease and/or pain.

This has led the author, when considering the work of S. Chang in "The meridian system and mechanism of acupuncture - a comparative review" (2012[2]), to a new idea, influenced in part by the work of this electrical engineer, and partly by clinical research. As the author is by training an electrical engineer, the thought processes were very similar. Chang's work covered very generally, but very thoroughly (57 citations) the efficacy of TCM and especially acupuncture, and the existence of models describing the meridian system, as well as the problems therein for each.

> *"Acupuncture is an important and integral part of traditional Chinese medicine (TCM). It has proved itself to be clinically effective for more than 2500 years and remains an energetic and vibrant treatment. It is fair to say that the widespread use of acupuncture in the East and West has helped millions of patients worldwide. This is perhaps one of the main reasons that in 1980, the World Health Organization (WHO) recommended acupuncture as an effective alternative therapy for 43 different disorders....*
>
> *"Due to bias, conflict of interest, misinterpretation, or misunderstanding, however, negative reports about acupuncture are also abundant." (sic, p. 1)*
>
> *"More surprisingly, 6 weeks of twice-weekly sessions of these three methods of administration can reduce both systolic and diastolic blood pressures for 12 months, as can be seen from Fig. 2* ***[Figure 1]*** *of that study [3]. Unfortunately, those investigators failed to point out the efficacy of acupuncture. Instead, they concentrated on making comparisons among these three different yet almost equally effective acupuncture techniques. Because the essence of the meridian system and mechanism of acupuncture were not comprehended, the investigators did not understand why these three methods would all work so well. Consequently, they did not emphasize the efficacy of acupuncture but only contended that the active acupuncture could not be differentiated from invasive sham acupuncture. An obvious case of misunderstanding due to this kind of misinterpretation is*

[1] [9]

[2] https://www.sciencedirect.com/science/article/pii/S1028455912001805?via%3Dihub&fbclid=IwAR00cq8NPSUGE8UHZbu0hbrDLpeckBGR9Hh4XSRc3mgVGuCbOghT3gIlh7M

exemplified in a 2006 editorial commentary [4]. In the commentary, the editor hastily jumped to the conclusion that "acupuncture is of no value for the treatment of hypertension" (emphasis added, p. 1)

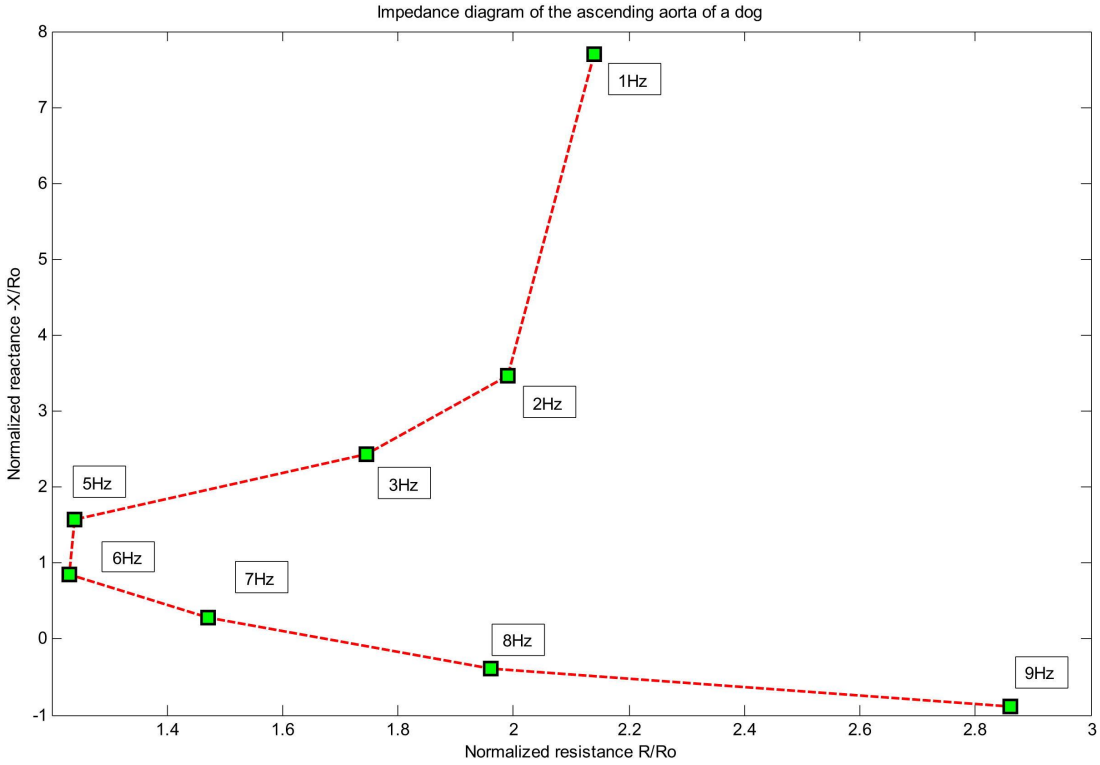


Figure 1 - *"Fig. 2. Input impedance diagram of the ascending aorta of a dog. From "Hypertension: a comparative review based on fractal wave theory of continuum," by S. Chang, 2011 Adapt Med, 3, p. 91–8"*

For the author's part, the three trials also proved excellent efficacy, with standard deviations in 45% improvement (single visit change in self reporting ordinal 0-10 scale) average between all three trials of only 0.24.[3] By contrast the variations in electric field changes were 6 or more V/m, demonstrating that the charge distribution changes in each person varied wildly with the type of condition treated, and point selection alteration. But the efficacy of treatment was very reliable for acupuncture and acupuncture with electrostimulation.

In considering the hypotheses[4] of Chang (2012), the author gained possible new insight into a meridian model that might be less abstract and certainly more demonstrable in clinic.

A. *"In terms of modern scientific language, qi stands for the fractal continua of vapor and water, and the complex dynamics of phase change in the water cycle. Without loss of generality, we can define qi as a mathematical dynamic system that is characterized by a triple (M, μ, Φt), where M denotes either a compact manifold or fractal continuum that can represent, for instance, the water, air, material, or the collection of state variables describing that material. For instance, the amplitudes, frequencies, or phases of periodic motions are some of the options for the state variables. Here, μ denotes a measure on M, and Φt: M→M a one-parameter group of continuous, measure-preserving transformation on M.*

[3] P. 8

[4] Chang also included a discussion of agrarian beliefs about the cycles of moon and seasons, five phases, etc… but although many parallels can be drawn between his statements and the author's research, there isn't space to go into them in this paper, only list them.

The mapping Φt is used to denote the dynamic behavior on M. The parameter t could be a real number or an integer depending on our observation or experimental setup. When it is an integer and generated by a fixed map Φ, the dynamic system will be discrete and can be denoted as (M, μ, Φ).” (p. 4)

B. *“The ancient meaning of yin-yang was actually referring to two fundamental operations in the universe or a dynamic system, now one dominating, now the other, in a wavelike succession [40], [41]. Hence, they could be modeled by a pair of sinusoidal functions with a relative phase difference. If the relative phase difference is 90 degrees and these two functions are perpendicular, then they will form a periodic orbit in the two-dimensional state space. Another way to represent the idea of yin-yang is to use a hyperbolic operator Φ on the phase space (M, μ, Φ). For instance, a well-known and important example is the phase-lead and phase-lag operator in the phase space. To describe it mathematically, M can be denoted as a torus: {(x,y)(mod 1)}, i.e., the phase space of two interacting or competing rhythms with measure μ = dxdy, and the hyperbolic yin-yang operator can be denoted as Φ(x,y) = (2x + y, x + y)(mod 1).”*

C. *“... the idea of five-phases can be defined as the Markov partition of the previous torus M by the yin-yang hyperbolic map Φ(x,y) = (2x + y, x + y)(mod 1). This hyperbolic flow Φ is also topologically semiconjugated to the subshift of finite type determined by the transition matrix*

$$A = \begin{bmatrix} 0 & 1 & 1 & 1 & 0 \\ 0 & 1 & 1 & 1 & 0 \\ 0 & 1 & 1 & 1 & 0 \\ 1 & 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 & 1 \end{bmatrix}.$$

Figure 2 - Matrix A, credit: S. Chang

Hence, the hyperbolic map Φ of yin-yang can generate five-phases as a Markov partition of the phase space M. The symbolic dynamics associated with A, a subshift of finite types, is very useful and at the same time very interesting.”

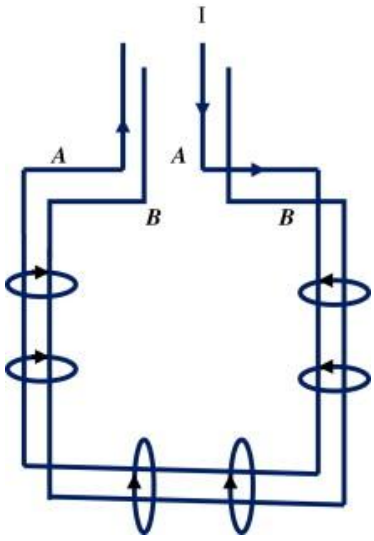
D. *“Furthermore, the transition matrix A can generate admissible trajectories in terms of symbolic dynamics. In case the initial frequencies of two interacting or competing rhythms are incommensurable, then their corresponding phase trajectories as functions of time will trace out a dense orbit in the phase space M, the first hallmark of chaotic wave theory. In addition, the set of functions* $\{e^{2\pi i(px+qy)}\}$ *where p and q are integers is an orthonormal basis of L2(M,μ). The collective effects of various rhythms can be defined formally as an infinite series of wave oscillations with random amplitudes* $\sum_{n=-\infty}^{\infty} \xi_n e^{2\pi i n x}$ *where* $\{\xi_n\}$ *is a sequence of independent, identically distributed standard gaussian random variables. Notice that this infinite sum will not converge, but if it is integrated over a period of time, the integral* $B(t)=\int_0^t \sum_{n=-\infty}^{\infty} \xi_n e^{2\pi i n x} dx$ *will converge almost surely and in the* L^2 *sense. This random Fourier series of a countable infinite number of dense waves is the second important hallmark of* ***chaotic wave theory****.*

“Once the ancient philosophical ideas of qi, yin-yang, and five-phases have been equated with concepts in the ***chaotic dynamical system****, they can readily be applied to TCM. It is noteworthy in*

TCM, however, that physiology is more important than anatomy, or function is more important than structure.[5]" (p. 4)

E. *"After studying voluminous traditional Chinese medical corpus,* ***the meridian system was deciphered as the complex network of neurovascular bundles*** *and their smaller branches,* ***which connect internally with the viscera, and externally with the limbs and sensory organs****.*
"However, based on modern histology, every primary neurovascular bundle below the elbows and knees, for instance, contains an artery and motor nerves that are centrifugal and two satellite veins and sensory nerves that are centripetal. All of these units are enclosed in a connective sheath to form a neurovascular bundle. This is why the primary meridians that are located below the elbows and knees have been claimed to be the neurovascular bundles[29], [30], [31], [51]. Hence, the meridian system in modern scientific language is equivalent to the notion of a complex network of neurovascular bundles and their smaller branches. This complex network is connected with internal viscera, peripheral limbs, and sensory organs. ***Anatomically, it is a continuum with self-similar fractal structure.***
"However, there are several major differences between the conception of neurovascular network in TCM and Western medical physiology. First, the neural system and circulatory system are almost always inseparable in the studies of acupuncture and TCM. When the functions of one system are impaired, then the functions of the other one are also influenced.
"Second, it is believed in TCM that the complex network of neurovascular bundles is connected internally with the viscera, and externally with the limbs and sensory organs.
"Third, it is believed in TCM that the circulatory system forms a closed circuit and the nervous system is also a reticular network.
"The next step is to characterize a meridian or its modern equivalent: a neurovascular bundle quantitatively for later applications in acupuncture mechanisms to be discussed in Parts 2 and 3. A neurovascular bundle has been characterized by its distributed conductance (G), resistance (R), inductance (L), and capacitance (C) as functions of time and frequency…" (emphasis added p. 6)

F. *"A schematic diagram to emphasize the mutual induction among the neurovascular bundles is shown in Fig. 3* **[right]**[6]*. Because it is only meant to explain the basic ideas, just two circuits, AA and BB, are shown. The nerve conduction signals and pulsatile blood flows in the contiguous circuits will interact with each other based on their respective self-impedances and mutual inductances. Consider first a vascular circuit AA, Fig. 3, with an alternating blood flow I flowing through it. In this case, the alternating or pulsatile blood flow will generate a very weak electromagnetic field. The magnetic circular flux through A is directly proportional to I, and the total flux that interlinks with a nearby neural or vascular circuit B is also proportional to I. This means that the contiguous circuits in neurovascular bundles will be mutually influenced. When the blood flow is started, stopped, or varied*



[5] The author maintains that this is only because of a) the loss of well known Hua Tuo (et al) surgical methods and documents, b) technological stagnation in the Mongol and Manchurian dynasties, and c) a lack of scientific emphasis in those state's imperial educational systems which needed China to remain in the past and advance as little as possible in order to control their respective empires. This, of course, backfired later on when western powers entered the political environment, and showed off their medical superiority. If the Chinese had innovated from the Tang forward, they would have long surpassed the Europeans in anatomical study, as they already had in many areas. See [10].Table 1
[6] Credit: S. Chang, p. 7

in circuit AA, it will induce a corresponding change within circuit BB. In neurovascular circuits, the mutual inductance and capacitance are often used to transfer energy or information from one circuit to another. The impedance can be defined as the ratio of voltage to current." (note added, p.7)

G. *"In Fig. 4, a feasible model of the meridian system based on the previous notions has been proposed [29], [30], [31]. In this figure, the primary meridians are characterized by transmission line impedance Z_2...,Z_{3n-1} for n = 1, 2, … , N. Here N stands for the number of primary meridians in TCM. According to TCM, in addition to the primary meridians, i.e., neurovascular bundles, there are other smaller branches that connect to form a reticular network system. For simplicity, only one of the smaller branches will be drawn in red vertical bars here. The* ***rationale for using cable theory in modeling meridians is actually derived from organogenesis and histology***[7]*. It is well known in organogenesis that different systems of the entire organism develop simultaneously [57]. They also interact and modify each other through the network of neurovascular bundles. In TCM, the meridians have the capability to control and regulate visceral organs." (emphasis added, p. 7)*

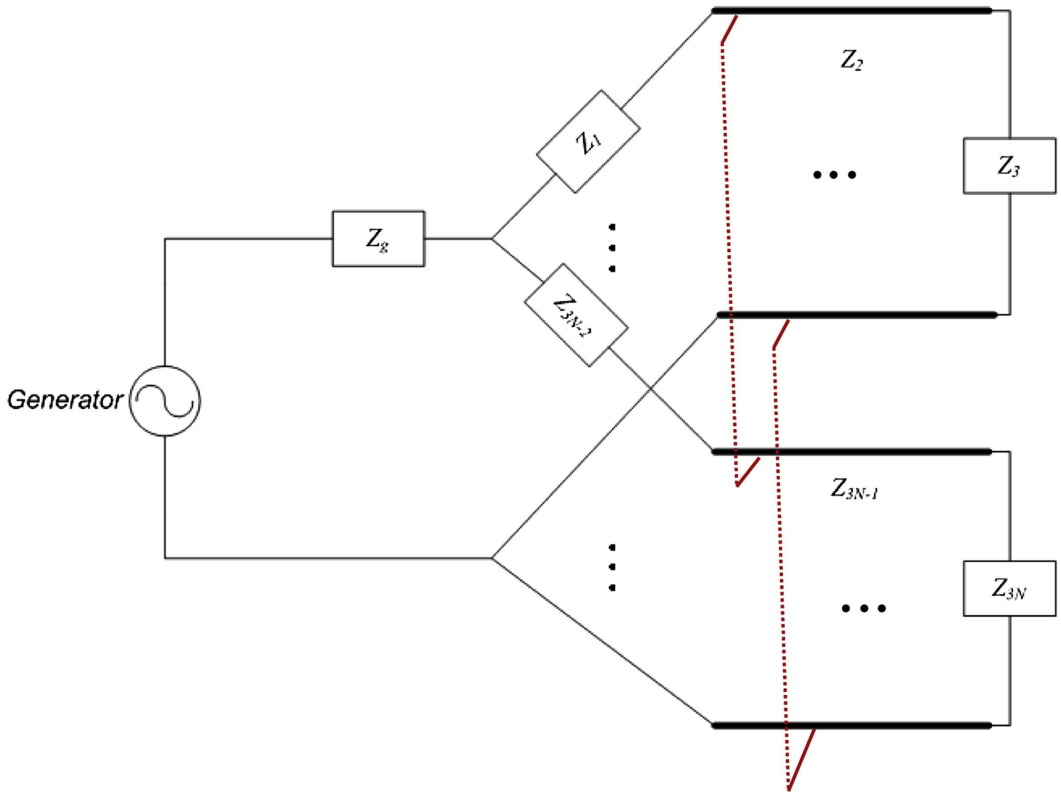


Figure 4 - *"Fig. 4. A tentative model of the meridian system in acupuncture. From "Physiological rhythms, dynamical disease, and acupuncture," by S. Chang, 2010, Chin J Physiol,53, p. 72–90"*

"In Fig. 4, the visceral organs that are closely related to their respective meridians are characterized by load impedances Z_3...,Z_{3n}, for n = 1, 2, … , N. Finally, Z_1...,Z_{3n-2}, for n = 1, 2, … , N are used to represent proper impedance matching so that each visceral organ and its associated neurovascular bundles will derive a proper ratio of energy or information flow from either the internal or external generator of rhythms with generator impedance Z_g. So as not to complicate this figure, the bifurcations of complex neurovascular networks will not be drawn further. It is understood, however, that the neurovascular network will have a self-similar structure as in any ***fractal continuum****." (sic, p. 7)*

[7] http://www.scholarpedia.org/article/Neuronal_cable_theory

Chang's model has the benefit of including a mathematical abstraction which is based in other theorems. However, if the author is correct, his own hypothesis may prove more reliable and foundational, as well as pragmatic. It may prove to be difficult in demonstration without the production of the author's diagnostic engine. However, the results, if proved, can represent a major leap forward in integrative medicine, clinical efficacy, immediacy, and diagnostics as well as prognostic enhancement.

Meridian Theory

What S. Chang has described in section E on the way to a *fractal continuum* model utilizing *chaotic wave theory*, is basically correct. The meridians, be they primary, secondary, extraordinary, or "jing-luo" (channels and networks or warp and weft) etc… have such intricacies as outlined.

- The circulatory and neural pathways are "inseparable" however, they do conform to compartmentalization schemata. For example, the pathways of one channel, which may be more neural than cardiovascular or tendinomuscular (TMM) will activate at different times of the day. So, the circuit is not purely analog. In a purely analog schema, changes in voltage, current, impedance, capacitance, and inductance would alter the behavior of the entire circuit. TCM does not make this assertion because that is not reality. When a person has influenza it may be true that they feel it in several compartments, membranes, tissues, etc… but they are quite able to pump blood, breathe, have mostly normal digestive capabilities, metabolic processes, and as Michael Jordan showed, even perform at a high level of cardiovascular and muscular function.[8] There has to be a method to describe separation as well as integration.
- The meridians do indeed link, and even control to a degree, the functionality of viscera and external tissues, causing mutual influence and communication between the two spheres of corporal structure. On the one hand the meridians must share positive information, and on the other, prevent transfer of metabolic waste, infected material, invasive pathogens, toxic material, and in TCM, even emotional or energetic thought information. This list is considered the *bing qi*, which is unhealthy or damaging. So a mechanism to describe this must model not only the positive interaction but a means for the body to determine the difference between *zheng qi* and *bing qi*. For example if a joint is inflamed due to cold it may be improved with heat, and/or transfer of heat through the meridians and acupoints to the joint. But if the joint is inflamed due to heat or fire (metabolic or autoimmune related toxin, such as Liver enzymes, gouty crystals, or Rh factor), then the meridians must respond oppositely, and not only try to shunt the heat away, but encapsulate it (such as bursitis), or actively resist it! This will not be covered with the passive model described poetically, but perhaps impractically by Chang.
- The meridian model indeed must contain both a closed circuit for blood and a branching (ie, reticular) design for nerves and "jing-luo", which function as both capillaries and nerves. The author will take this further: actually the meridian model must also describe a fast-linkage network that performs the physical (ie, mechanical) functions of the TMM as well as explains the mechanism of fascia to prevent or cause disease, even *store* energy and qi (for good or ill) for extraordinarily long periods of time (months, years, decades). Moreover the closed loop must describe **four** periodicities:
    - The ability to transfer typical nerve rates and responses (ie, reflexes), for many times needle insertion in one location of an unrelated structure will elicit a strong and unpredictable response

[8] http://www.nba.com/top-nba-finals-moments-michael-jordan-flu-game-game-5-1997-finals

in a distal location. Not all attempts to describe this through neurology are successful, possibly as fMRI mapping of the entire nerve network (plus ancillary related tissues) is not complete (or possible). We will call this fast rate.

- The ability to circulate over minutes to hours of time; medium rate.
- The typical circadian rhythmic cycle which is both daily and monthly, or even seasonally; the slow rate.
- The very long cycles of change both in genetic evolution but also governed by previous stimulus input, which may manifest much later in a lifetime, or affect the person *throughout the rest of their lifetime.* This we will call the long rate.

In whatever model - or combination of models - which emerges, it must correctly describe both the patho-physiology and anatomical behavior which the original meridian theory was developed: clinical experience and efficacy. For one thing, it may be true that *some* of the acupoints were discovered through neurological or psychological methods. The author has made a few such discoveries himself. However, these isolated discoveries cannot bring about a successful (lit: efficacious) model that satisfies both symmetrical harmony sentiments and pathophysiological facts.

For example, regarding the long rate, consider the strange connection in pathophysiology between foot injuries and Parkinson's Disease later in life.[9] [10] There would be no discernible reason, without meridian theory, to account for this connection in western medicine; much less for more strange, "idiopathic," even perverse means by which disease may linger, or start in one form and transform into another, move, lodge or dislodge, instigate other diseases and syndromes, spread, etc…

Whatever model emerges for a western scientific approach to a modern meridian system - even if it means the discovered fibre-optic like tubes of the primo-vascular system - it must reconcile previous methodologies (such as dermatome and myotome connections, as per Chang) as well as future discoveries. Such discoveries may be neuropsychological, biochemical, neurochemical, hormonal, mineral, or bioelectrical, and most certainly will be related to pathology research, psychiatric research, and medical practice (such as surgery, treatment of trauma, etc…). They also have to cover all the time cycles and stretches in TCM.

Chaotic Wave Theory and Fractal Continuum Modeling

The concept of chaos wave theory and fractal continuums appears to be a non-linear quantum based connectivity. Further explanation is found in Chang (2013)[11]:

> *"...a chaotic wave theory of fractal continuum was proposed to characterize the essence of the ancient meridian system as a complex network of neurovascular bundles and their smaller branches [14]. This complex network is connected to internal viscera, peripheral limbs and sensory organs.* ***Anatomically, it is a continuum with a self-similar fractal structure****. Physiologically, it interacts with the internal viscera, peripheral limbs and sensory organs via the chaotic waves of blood flow and nerve innervations." (emphasis added, p. 1)*

The majority of the second paper is unnecessary for the premises of this paper. What is of note is the concept of self-similar structure. This, presumably, must mean not the physical appearance of individual tissues, because the tissues that were discussed in the Synopsis almost could not be more dissimilar in

[9] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2783142/
[10] http://pdrecovery.org/wp-content/uploads/2012/11/Recovery-from-Parkinsons-FINAL.pdf
[11] https://core.ac.uk/download/pdf/82440994.pdf

outward appearance and function. What connects them, rather, is the tendency of spreading "root-like" growth, of connecting and circulating, of communication (via transport), and of the function of generation and/or regulation. Of course the cable theory generally describes electrical signal propagation in dendritic growth.

The author also completely agrees that it is a "complex network." Although most of the readership will have an idea of the word network, it bears defining,

"A network, in the context of electronics, is a collection of interconnected components."[12] [or nodes[13]]

For it to be said to be complex, is probably an understatement. The estimated number of cells in the body is ~37.2 trillion[14]. It follows then that the relatively few branches of nerves which strike out from the central nervous system must distribute into thousands, then millions, then billions of connective relationships. From the perspective of complexity theory, it *should* follow that such a system is too complex, and will break down due to problems which arise. If one considers also the number of potential invasive pathogens, or circumstances, or the vagaries of nature's supply of resources of food and nutrients, water, etc… it is an unexpected outcome for such a network to remain in homeostasis, let alone thrive. There must be a conscious-like ability of the network to adapt, to overcome, and intelligently stave off breakdown.

This is truly advancing the model, because there is nothing in the concept "chaotic wave" that suggests an almost conscious-like behavior of adaptation. Not that Chang's vision is not part of the solution. The author envisions the CWTFC to be an intermediary model, but not a model for the foundational level. It may be foundation for some of the communicative, structural aspects or functions of the meridian system, but it is very weak in the areas mentioned. If one were to describe the cardiovascular system in terms of cardiac output, oxygenation, and blood pressure this would cover many physiological aspects of the CVS. However it would be ignoring all of the finer points which fully define the CVS in a fully anti-pathogenic and completely responsive manner. It must, of course be explained also with the electrochemical aspects of the systolic and diastolic, and with a relationship with endocrine and exocrine systems (for example the renin-angiotensin) system.

Finally - to be complete - there must be a remark said about the less physical functions of the meridian system. As a series of examples,

- The heart distributes blood and yin for menses and follicular development, but also heart *spirit (shen)* is necessary to create life. It "communicates" with the Kidneys by transporting to the lower jiao (pelvic cavity).
- The "window to the sky" points are primarily in and around the neck, with one of the primary ones being ST9: the vagus nerve.
- Diversion of psychic trauma into storage in the enteric nervous system and surrounding viscera (throughout the mesentery); this creates psychosomatic trauma.
- Transport and storage of jing-essence (non-DNA, non-marrow).
- Storage and encapsulation of invasive pathogens, parasites, *and* energy… of many types, including supernatural.[15]

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[12] https://en.wikipedia.org/wiki/Network_analysis_(electrical_circuits)#Definitions

[13] *"A point at which terminals of more than two components are joined. A conductor with a substantially zero resistance is considered to be a node for the purpose of analysis."* For our purposes, the acupoints are to function as our nodes. However, there must (in reality) be many millions, even billions more nodes. Potentially there would be 37 x 10^{12}! more nodes

[14] https://www.smithsonianmag.com/smart-news/there-are-372-trillion-cells-in-your-body-4941473/

[15] There is some evidence that ghost energy (gui) are actually plasmoids.
https://www.youtube.com/watch?v=DJAmj1NxJ_w
This video was shot with the author on location; the plasmoid seen at 0:30 was only seen in low light mode, and not with unaided eyes.

- ❖ The regulatory functions, couched not in terms of hot and cold, but yin and yang, generally.

In order for these functions to be included, the mechanism must either rely on a very, very complicated mathematical model, or another concept of non-linear (fractal or recursive[16]) mathematics: emergent properties. In particular, the emergent property is complexity-consciousness: sentience created by the increasing number of nodes between structures (perhaps cells, perhaps pathways). If the sentience is centered around relative[17] energy levels (charge accumulations and flux), this will explain three things simultaneously:

1. The importance of thermal[18] equilibrium in the health vs disease axis (or balance).
2. What mobilizes structures to behave in the robotic/machine-like manner that cellular processes have been determined to behave like.[19]
3. Pathophysiology, especially as it relates to the author's hypothesis in the aforementioned study. It is expected, that charge enters into the pathways, being very much smaller than the "pipes" (even the microns big primo-vasculature[20]) will certainly (if built up in substantial enough volume and 'lodged' by any mechanism known or unknown) interrupt the homeostasis or balance. The supply of charge (energy) may be cosmic/stellar, magnetic, chemical, mineral, caloric, or other.

This is the crux of the Charge Distributive Network (CDN) model. Firstly that it is energy which powers the network's behavior and sets the parameters for healthy physiological behavior as well as constitutes the pathophysiology when charge/energy is introduced or stored that disrupts the flow or homeostasis of any given network. There will, naturally, be sensors and fuse-like switches to protect the tissues of one network from the diseased state of another. But, as would be the the case in a leaking ship, even if one area is sealed off, there may be leakage into other compartments which defeat safeguards and require a more systemic approach (such as fever or inflammation), in order to overcome the state of disequilibrium. The vagaries of potential energy gradients will explain all the various responses the body has, when it is cold or hot, deficient or excess, to stimuli which are similar or opposite, creating seemingly random responses. It isn't that heat or cold is inappropriate, it is that the energy state in the tissue may have shifted due to charge circumstances. For example:

- ➢ In one osteoarthritis patient, particularly a female in her 60s, heat feels extremely good on the low back.
- ➢ In another osteoarthritis patient, perhaps a male with a recent injury in last few months, tries to use heat, and at first it feels better, but then during the night their injury worsens; they become reliant on icy-hot or biofreeze lotion (analgesics).
- ➢ In a third such low back pain patient, the application of cold must be alternated with heat, because it is autoimmune related.

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[16] *"This subtle patterning information of gap junction transferred electrical information (1st level) must then be transduced into the genetic machinery - including specific gene expression (see Adams and Levin, 2013)... However, to evolve a complete organism from a fertilized egg, these cascades of events have to be* ***recursive*** *to the genome and back in the different layers of organization, being another further challenge for bio-informatics and (fractal and other) bio-mathematics." (emphasis added)*
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4429568/?fbclid=IwAR2iLH8uFTED8DBtFonqFsJQncv4CdUgkCAlfEVhFfdm1u_0g5J7sShRxi0

[17] The author is not sure what the energy levels may be (only that they would be very small), it's probably independently determined not only per cell but by tissue, and with slight variation within 'normal limits' that will be seasonally, even monthly variable (with moon phases). This will be important for explaining the mechanisms of disease in the later example.

[18] Infrared energy is EMF, and measurable in eV or in j; but if photons are indeed coaxial electric circuits, then it can be measured as electric fields in nV/m or j/C.

[19] https://www.youtube.com/watch?v=xlPDEpimzB8 for example

[20] https://www.sciencedirect.com/science/article/pii/S2005290113002082

Bear in mind, these examples aren't including other energetic interventions, such as massage, oil, magnets, moxa, compression, traction, etc…But the point is that energy can be added (or subtracted) from the system, and the network has different responses and **they are not disease dependent or equanimical**. In western medicine, naturally the goal is instead to have equivalence. For example for all myocardial infarcs, to use the AED or paddles to restore the heart. However, in practical matters of fact, it will not work in all cases. Just the same as antibiotics, vaccines, and surgery: they do not work in all cases. In TCM this is not assumed to be an accident or a matter of Fate, but of ignorance of the total truth of the situation. Perfect diagnostics and opportunity would enable perfect prognostication and practice of the healing art.[21]

There isn't anything in chaos or fractal mathematical models to suggest this. It should, in theory, agree with the western paradigm: all allopathic approaches should produce the connectivity required to produce the efficaciousness required. Obviously some type of allowance would have to be made, but the problem is that the model itself implies a purely reactive, instinctual system: like the Chinese mythical snake that strikes with either end no matter which you touch, and with both ends when you touch the middle. The system should just *react*. But, frankly: it often doesn't.

Consider a recent case: 65yo female reporting bursitis of the hip. Idiopathic. The doctor prescribed physical therapy, but the patient already had great results two years previously with acupuncture. So she comes to see the author. The case is clearly a triple matter: one is the factor of recent weather changes causing shrinkage of the TMM passing through the iliotibial band. Secondly there is atrophy in the legs and hips. Finally, the cold outside has induced the channels to close the bursa sac. The author applies TMM channel therapy, and attaches mico-voltage electro stimulation at 35 Hz (relatively fast), cross from the TFL muscle to the gluteus minimus, and from the trochanter (which was 'sticky' upon insertion) to UB62, the outer point of the "yang qiao" (yang stepping/heel) channel. 50 minutes later the patient reports parasympathetic twitching, but more importantly the presence of a charlie-horse (cramping) like sensation at K1 on the sole of the foot. This is the inflammation of the bursa being guided out of the body. The hip, opened up, resolves within one treatment. Previously the bursa withheld the inflammation, but by **adding** energy, it was coaxed into releasing and thereby *decreasing* its relative energy level (locally). If measured, the blood sugar always drops on table. But, the key was aside from the electrostimulation the author instructed the patient to perform a fire-wind type breathing exercise, which energizes the system and enables the "zheng qi" to "chase out the bing qi." This is not only electrical but fluid dynamics and a matter of pressure in the PVS.

Whatever model comes from the research or gets through the trials, it must be able to account for the active, even intentional or intention-responsive aspect of meridian behavior. In the following section, the author feels that he has to offer just such a possible model which may serve as a basis or foundation for a greater system. This may potentially lead to a more complicated schemata which can revolutionize energetico-mechanical medicine and CAM.

[21] This is why it is called a practice: one's efficacy should increase with age and experience.

Charge Distribution Networks

CDN is a concept the author has innovated. A Charge Distributive Network is an active network of circuit nodes, with built in active sensing of mutual voltage and current levels. See Figure 5.

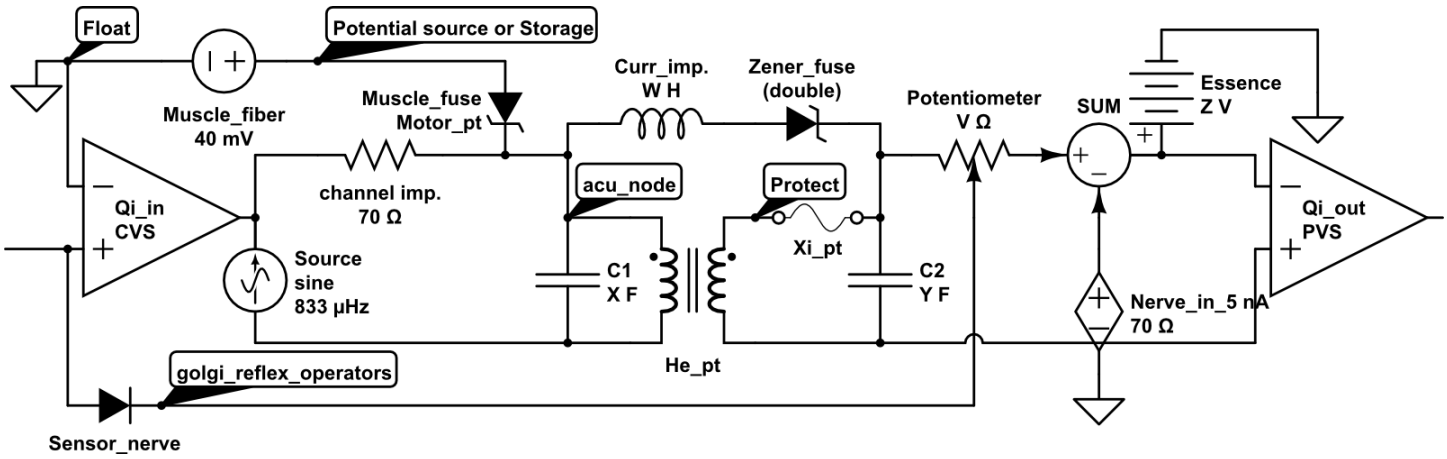

Figure 5 - Charge Distributive Network (version 1); credit: author (circuitlab.com)[22]

There are several remarks that must be made about assumptions and limitations of the model:

1. This is a semi-symbolic, semi-literal model. Where values will float, algebraic notation is used. Where known measured values exist, they are given in avg form.
2. The cardiovascular Qi charge in is probably totally relative to the tissue, volume of blood, nutrient count, etc… It may be damaged or accelerated by excesses and deficiencies of energy such as:
    a. Caffeine or other stimulants
    b. protons/nuclei (cosmic rays and solar wind or lunar rays)
    c. Electro-stimulation
    d. Vitamins or other energy sources
    e. Sugar and salt levels
    f. pH
    g. Magnetics or other exogenous modulators
3. The channel impedance in will be ~ 70 ohms, based upon research.[23] However the outward impedance will be represented by a potentiometer, as it is assumed that breath level determines the openness or alignment of flow.[24] This is modulated by a golgi_reflex sensor, symbolized as a one-way diode.
4. For example the current source of previous channel is avg of 0.00083 Hz based upon an avg circulation of unstimulated channels of 1x/20min. This is a typical cycle (although some sources say 28 min and some 15 min). However, that current source can increase dramatically, well into the 10-50 Hz range.
5. One will note that the outward amplifier is to the prime-vascular system (meridians), showing that the acupoint functions as both a health transformer and fuse, as well as a generator for the remaining circuit. As the CVS is the previous input, cardiac output, respiratory output, and muscular energy will serve as the “creation” of energy, and will come together for the meridian.

[22] https://www.circuitlab.com/circuit/4x4z74b8v24z/meridian/
[23] https://www.ncbi.nlm.nih.gov/pubmed/15882468
[24] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1142259/pdf/1472-6882-5-10.pdf

6. The function of the zener diodes is to enable typical one-way flow, but also energy backwash, particularly during unhealthy periods.
7. The capacitors symbolize *local storage* in cellular tissue and transport. Or within a compartment. Muscular Voltage is ~ 70 mV avg but this can vary widely with muscle capacitances.[25]
8. The inductor functions as a current resistor, opposing the change of flow in the point, but also perpetuating it, post treatment (for a time). Its value is floating, however it can probably be simulated with the change in charge over change in time, and so is a dependent inductance upon the current source. (Fractal Continuum)
9. The transformer symbolizes the function of the acupoint, not an actual coil series. Its name is usually known to people as a “chakra” but a better word is a “nadi” or acupoint. Here it is symbolized as a He point, as He means uniting.[26]
10. The fuse associated is symbolic of the synaptic gap which remains open during healthy functionality, but if damaged, ceases flow at the small nadi. This forces any “negative” energy to flow backwards through the zener (against the cells’ wills). It can be done, if energy is strong enough (enough charge, or high virulence). But the body will oppose this reverse flow, until the source of negative energy is strong enough to keep the meridian flowing backwards. As it is an analog circuit, it absolutely can and does in actual disease situations. It is symbolized by the Xi point which is typical for controlling chronic and acute disease.
11. The type of point and tissue hosting the meridian will alter the values. For non transforming points, windings become 1:1. For stronger voltage sources, current values may increase. For points with little to no vasculature, the fuse protection can be eradicated with 0 impedance.
12. The sum of the energies, be they metabolic, respiratory, nutrient/blood, or hormonal (essence) will be combined with neural supplementation. Nerve conductivity has been shown to be between 4 & 6 nA[27].
13. The “extra” charge will be stored by the body in a numerous variety of ways, including a long term “battery” of storage the Chinese called Jing (essence). The main location of these batteries is in the adrenals, small of the back, bones, and teeth.
14. The final signal amplifies the signal reaching towards the next node. As with axionic or dendritic neural processes, several signals would come together to form a strengthening of the signal. As Chang has pointed out, the Qi dynamic is akin to a water cycle dynamic (Chaotic Wave). The result of this is that many streams become creeks become rivers become lakes and oceans. Essence would be symbolized as wetlands. The unknown factor in this is the connective tissue (San Jiao organ) which has massive mitigation pathways and energy reserves that are little understood, but definitely show fractal behaviors in mechanical deformation.[28]
15. The ground is floating. There is a typical Earth ground, but this is not usual in modernity. For one thing, people wear shoes. For another thing, the various tissues of the body will have different compartments and needs. The grounds on each side of the transformer are likely to be slightly different, as the expected voltage change down the length of the main nerve branches (jing-mai) will differ significantly over long distances, but not much in short distances. They will vary with nerve rate conduction.
16. The fractal continuum means that this model can be modified in slight ways, but will generally represent the entire channel as well as a single point.

[25] http://jgp.rupress.org/content/jgp/67/2/125.full.pdf
[26] http://bluelotushealth.com/whats-a-he-%E5%90%88-point/
[27] [5].Table 7
[28] https://www.youtube.com/watch?v=eW0lvOVKDxE

17. Assumptions include: Qi is related to charge[29], the existence of physical channel pumps (or pipes) known as primo-vasculature, the transformability of chemical, kinetic, mechanical, energies within local tissues throughout the body, but directly mitigated by hormones and cardio-vasculature and nerve physiology.

The author does not make the claim that this is a final model, only that it is a model which more closely analyzes the behaviors of meridians in known pathophysiology within TCM and health in general.

Wind Theory of Disease

In the previously cited work by the author, “Clinical Electric Fields Measurements in Three Trials,” the hypothesis is explained in brief and then in depth in the Appendix. The diagram is shared again here as a reference for the following extrapolations.

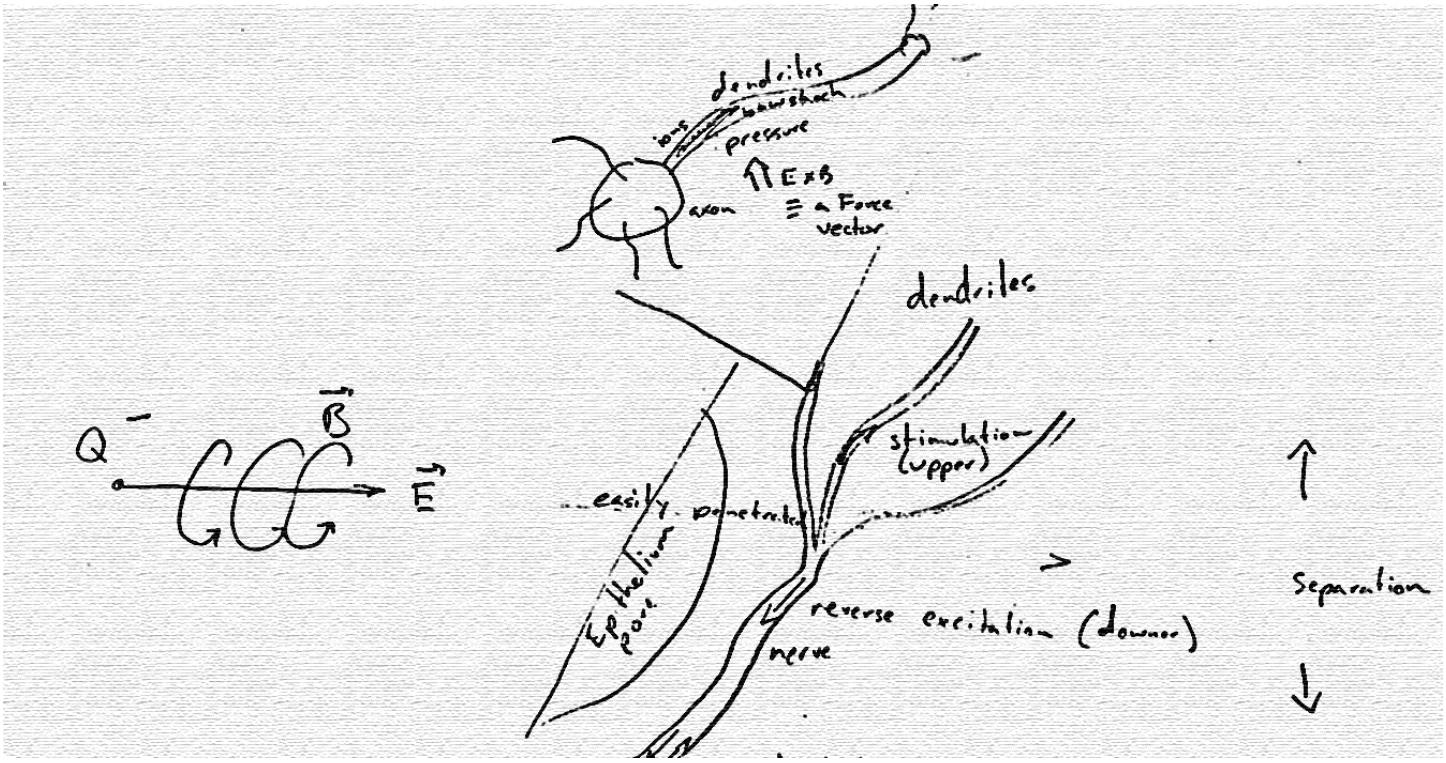

Figure 6 - Charge as a source of disease; credit: author[30]

The discussion in that paper of charge separation generated by wind can be summed up as: friction increases the gradient over distance. The collection of charges is delivered to the body in a dynamic, even organic way. Life can be said to be *literally swimming in charge*. It may actually be true that the entire Universe is swimming in a charge sea acting as the aether,[31] but what’s relevant herein is to discuss (a) the mechanism by which health is maintained as a balance, and (b) lost in the generation of disease, and then (c) cured again (using acupuncture as the mechanism of focus).

[29] [9].Appendix A
[30] [9].Appendix B
[31] [12]. [13]

In homeostasis, a presumed relative floating voltage and steady current is presumed in a raised impedance environment (higher for typical tissues, up to 300 ohm, and lower for nerves and jing-luo ~70 ohm or less during alignment procedures, such as meditation etc…) therefore health is presumed also to be a state of continual flow of charge in alternating voltage amplitude as well as impedance. Consequently a healthy system will generate a moderate magnetic field (or aura) which will not be the source or measure of health, but a correlation of it. This would explain differing kirlian photography results for disease and health.[32] [33]

In disease, the presence of extra, even exogenous charge, would impede the typical flow of nerves and channels (jing-luo), and inhibit physiological function through interference. On a practical diagnostic level, one could measure blood sugar levels, oxygenation, and nerve conduction rates. But on the chemico-molecular level down to the membranous level, the influence of quantum electrodynamic fields will have the most significant bearing. Think of this level as the cell's measuring its own form of blood sugar, albeit much smaller. But the radiative influence of a charge or ion at this scale will be much more powerful within that range than would a single molecule of sugar on the macro scale of a tissue, organ or overall health and homeostasis.

What would then be the role of wind in Chinese medicine as the "bringer of 10,000 diseases?" Clearly, it is the introduction of exogenous charges, collected either astrophysically in the atmosphere and distributed through Earth's outer shells into the human scale dynamic (mostly through wind and precipitation, but also as radiation), or collected frictionally in the redistribution of dust on the crustal membrane of the confluence of the Spheres of Earth and Spheres of Heaven[34]. The crust is a highly active charged environment where solids temporarily form and crystallize on a more semi-permanent basis, between layers of fluid/condensed matter and gas and plasma. This junction is unusual because at first it appears to disobey phase changes we expect (solid to liquid to gas, etc…).[35] Then we must realize the relationship is mirrored in the opposing direction, and the behavior of electromagnetic radiation and plasma mitigates the energy (mostly ions) exchange between the layers, with humans and life in between. Life is then a consequence of the interchange at relatively stable and specific conditions.

Condensed Matter > fluid > solid > gasses > ionic > plasma/charged

<-- increasing crystallinity increasing charge fluidity -->

The correction of disease, autonomically or through therapeutic intervention, would necessarily involve the thorough redistribution of charge in all cellular pathways, tissues, organs, compartments and systems, until balance is achieved in all relevant markers: mineral, blood, hormonal, nerve conduction, psychic parameters, pain levels, etc…

In the case of acupuncture, the solution is straight forward: metal needles quickly mitigate this behavior in the jing-luo (including nerves, fascia, connective tissue, sense organs, lymphatic tissue, muscle, and skin). They primarily do this by activating locale nodal transformation, conducting excess charge out of the needle[36] and increasing the efficacy of conduction. How this happens despite tissue damage from the much larger needle[37] is probably a matter of a relationship between the centrality of the region of nodal activation (some acupoints being larger than others, after all), and the depth of penetration. Why would the depth be relevant?

[32] https://pdfs.semanticscholar.org/4bf6/251658f724550984eacc9961335b50cbf16d.pdf
[33] https://www.disclose.tv/kirlian-photography-shows-organic-uncooked-food-to-have-stronger-energy-fields-308577
[34] [4]
[35] It is also unusual because it is so discreet. Ground is next to sky, without apparent sublimation.
[36] Or in the case of fa Qi and massage: out the hands of the practitioner.
[37] It is expected that even small gauge needles will be much larger than cells

It is said in TCM that the deeper the body tissue, the greater the reserve of Qi. In this case, literally there is more charge (perhaps blood content or "ying" or oxygen content) at greater and greater depths, with the most energetic reserves being located in source regions and marrow. This is the "battery". If the battery becomes the amplifier, and if an electro-stimulator becomes the current source for the next circuit (see Figure 5), it is expected that the flow will be significantly larger, leading to greater and greater amplification of signal.

Furthermore, the signal amplification will relieve the muscular and neural voltage sources of "load" (obligation or drain/taxation). This will increase relaxation. At certain points, there will be anti-sympathetic modulation, leading to fast, conspicuous muscular and neural fasciculations. This is demonstrably stronger with guided respiration and decreased noise interference from the CNS (iow: less thought signals[38]).

When these fasciculations reach higher and higher values, the control signal will propagate through other channels in powerful, amplified signal and with well documented augmentation from neurochemical release (dopamine[39], serotonin[40], endorphins[41], DHEA[42]). This will lead to parasympathetic involvement, increased peristalsis, enhanced metabolic function, enhanced immune response, and a positive feedback cycle in the endocrine system. The best example of this is enhanced thyroid flow when vagal fasciculation (via ST9) is released and skin reflects red back flow of obvious inflammation markers).

As the signal propagates, the overall voltage to the "left" of figure 5 will begin to far exceed that of the right side, and reverse the diseased "reversal."[43] **It is important to note that the efficacy of the session or practitioner will depend heavily upon successful signal propagation** influenced heavily by:

- ❏ Hydrodynamical pressure (caused by proper intentional respiration activating hypodiaphramatic levels
- ❏ Proper hydration and oxygenation *in blood*.[44]
- ❏ Effective stimulation technique:
  - ❏ Overstimulation of reserves of charge may damage voltage and current sources
  - ❏ Interference of charge from unhealthy practitioners, or even introduction of pathogenic antigen signatures may reduce charge evacuation
  - ❏ Reverse stimulation may lead to permanent damage
- ❏ Nutrient level; effectively: blood sugar levels at time of treatment, or rarely: on average

The benefit of this model is in the ability to explain rather unusual situations such as:

- ➢ The strange and intense effect of heat upon energetic young male athletes, particularly cardiovascularly.
- ➢ The difficulties in treating highly virulent conditions, such as the 1918 flu, in healthy male populations
- ➢ The known difficulties in terminally ill patients to die, without intervention[45]
- ➢ The end of long-term comas with full wakeful consciousness.
- ➢ The ability of acupuncture to suppress epileptic disorders.

[38] Aka: letting go
[39] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3222639/
[40] https://www.ncbi.nlm.nih.gov/pubmed/16565594
[41] https://www.ncbi.nlm.nih.gov/pubmed/15135942
[42] https://www.ncbi.nlm.nih.gov/pubmed/18711761
[43] http://www.paradigm-pubs.com/sites/www.paradigm-pubs.com/files/active/0/DiaTCMChe_E.pdf
[44] Excessive adipose tissue or short upper respiratory "accessory" inhalation will have no added benefit, or may in fact worsen the reverse flow signal.
[45] At Hospice of San Diego, nurses utilize acupuncture students to introduce positive signals for certain patients having a difficulty in passing on. The author has participated in at least three such "rainbow sessions." In TCM, it takes Qi to sleep, and it takes Qi to die. The yang must "rise" in order to separate from the body. As it does, patients frequently display sudden alertness and often deceptively positive health markers, which can fool family members into false hope.http://www.hospicepeterborough.org/wp-content/uploads/2016/05/Web-version-The-Last-Hours-of-Life-2010.pdf

Finer Details of the Model

There are some *extra details* which must be outlined. Firstly let it be known that the model must describe real circumstances, and the pathophysiology of both eastern **and** western medicine[46] must be operative and realistic, because there is only one body and for the most part they are all the same. Even where bodies differ in certain chemistry or anatomical mutations, the reality is that the channels and systems of the body all work the same way.

Secondly, the model must describe *future, as of yet unknown* behavior. It must be specific enough without being rigid. There will likely, therefore, need to be augmented component behavior, or the substitution of more specialized and/or descriptive parts. It may even happen that through clinical trial deterministic, specific values for components currently algebraically labeled will be found and can be applied.

Given all of that, there are some other finer emergent details that can be discussed in a theoretical way. For example, in Figure 5, the node labeled “float” represents the “ground” of previous tissues or compartments. But the implication of the analog circuit is that the muscles, amplification (from CVS/respiration), and current Source (Yuan Qi) are all in parallel. So they share voltage levels, and distribute charge between them. So, in a reverse direction - and this is pure speculation - one would expect reverse energy sources, such as infections influenza, to affect all of these. In the case of influenza, as a classic example, this is indeed the case. Influenza’s prodromal symptoms (what is termed ying & wei separation[47]):

- Muscle aches
- Fever and chills
- Headache
- Spontaneous sweats
- Slight cough or wheeze
- Shortness of breath or stamina
- Weakness and malaise
- Nausea

Most, if not all of these symptoms can be explained with the model, either via a reversal of charge flow, or an accumulation in some other region of the body and depletion locally. Or they can be explained as a matter of charge stagnation, which would obviously prevent transformation.

Acupuncture works to restore the original flow, and hence why it is quite possible to either end the flu with early treatment during the first hour or so of symptoms, or to shorten the duration of misery to merely 1-2 days, instead of a week or more. Furthermore it is possible to prevent pneumonia and bronchitis by pre-establishing flow within the lungs and throat. Another method to accomplish similar results in the treatment and prevention of cold and flu is to administer an herbal decoction, such as Gui Zhi Tang. However, in the

[46] The primary difference between these differential diagnostic paradigms is that eastern medicine focuses on *pattern* diagnosis, while western medicine focuses upon disease and syndrome diagnostics. But both have both. For example in western medicine, there is fibromyalgia and chronic fatigue syndrome, or degenerative disc/joint disease. These are actually patterns of disease. Meanwhile for all the TCM patterns, there are specific diseases, such as *propping rheum* or *plum pit qi*. But there are also syndromes such as *wei syndrome* (atrophy and hypoglycemia) *and bi tong* (painful obstructive disorders, such as osteoarthritis + DJD, or thoracic outlet syndrome).

[47] Ying is nutritive Qi or blood plasma; wei is defensive energy, and includes the white blood cells as well as nervous response to pathogenic or traumatic invasion.

author's extensive experience, timing is important, but delivery method only requires the tongue's involvement, but it is possible to use granules instead of boiled herbs. The energy signal is important, not the method (perse). So long as the incoming signal re-establishes the transformational mechanism, and even surges through the circuit and amplifies the positive signal, in nerve and blood flow, as well as "Qi" if it exists… then the result will be excellent, even miraculous or life-saving. But the accumulation of unwanted charges or energy signatures (coming in this case from viruses, but also exogenous "wind"[48]) will undoubtedly create a situation of stasis in *any* kind of channel in the body. As that will also be the death knell of most analog circuits, but especially one with a short protected only by a zener diode, the author feels this is a sufficiently wave-like model.

If, for example, the body is flush with Magnesium, or Potassium ions… the expected result will be muscular spasms. This should be reflected by an accumulation of charge (minerals are usually in ion form in the blood) that causes the voltage to back transform and interfere with the input signal. It may be that the amplifier node will not enable that, but the nerve current controlled voltage source will.

Another finer detail may be the potential "three phase transformer" situation in the model (compare to Figure 4). The author is not an expert in three phase transformation, however it does bring up the question of multiple signals within the system. In the author's opinion positive signals can propagate forward simultaneously as negative signals propagate backwards. Without specific parameters, it may be difficult to identify which situations this could occur.[49] However it really is beside the point how specific the model could be. But the reality of channel flow, in terms of bioelectric signals, must be dual direction flow. In the case of neurochemistry, it is two direction pathways that often exist along the direction of a single direction channel (for example the Du, which is the spinal cord). In TCM the channels must carry both body signals (Qi control and movement) and psychic energy.

There are many more discussions that could likely happen regarding two or three-phase signals. It's important to bear in mind that the model is semi-symbolic, and there are no actual coils as such in the points or tissues. That doesn't mean there is no induction. In a previous work, "Scalar Magnetic Waves and Qi," the author describes the method of DNA/genetic alignment and the magnetic induction occurring in small rings.[50] However, that would be a three-fold level of transformer between the rings, coils, and chromosomal level… all within a single chromosomal arm inside the nuclei. So there is literally no possible way to calculate that level of inductance. It must be empirically measured as a range, and simulated on that level.

As for a last detail, the author must comment on the amplifier components. The exact component parameters are, of course, not known; but specs could be derived. As for amplitude or voltage level amplification vs current or frequency amplification, the author favors the former. But it could be the other, or both. Also, it's possible the component isn't needed as it may be purely symbolic. The author thinks they are

[48] The author spent many years suffering from yearly multi-seasonal bronchitis, and was able to cure with these methods. One thing he learned along the way is that westerners typically don't have wind exposure - perhaps AC - but instead consume excessive sugar *and* are influenced by cold drinks and weak pores during seasonal shifts. Presumably there is a solar factor as well, given the seasons relate to the sun. But the author has no data on that at this time. In other works he will explain the mechanism of the rotation of seasons as it pertains to exogenous pathogenic attack. But at this time, suffice it to say, sugars must provide a similar vector as exogenous charge introduced through wind. Sugar is a polarized molecule. http://www.middleschoolchemistry.com/lessonplans/chapter5/lesson4

[49] Automated simulation of circuits run on supercomputers, ported to CSV files, then parsed with scripts into spreadsheets, can then be autoplotted with macros in VB to make 3D surface plots. That can be used to determine the parameters of the circuit to identify weaknesses. However, the number of possible surface graphs would probably be prohibitive for a single person, so it is far more ideal for medical research to eliminate as many variables as possible, since some variables cannot be eliminated, only limited.

[50] https://www.academia.edu/8547496/Scalar_Magnetic_Waves_and_Qi_a_first_draft_of_a_hypothesis

necessary for the distance covered and the facts surrounding the source's original signal, etc... Even at the "end" of a meridian circuit, a signal must exist to power the tiny "well" points of the succeeding channels.

Proposition for Testing

In a previous note above (49), one method for simulation was proposed. However, in the author's opinion, there is no substitute for clinical trial and observation. Already several roughly defined ranges and facts are known about impedances[51] and capacitances. Although in TCM we say that muscles are "reserves of Qi and blood," the clinical research has actually determined capacitance values. There are clinical trials to test for inductance in nerves[52], and these may be sufficient. However, it is more likely that the inductances have to be measured in 10 -20 different meridians and acupoints to find the entire range. The author proposes the use of a simple e-stim test device, and an oscilloscope. See Figure 7:

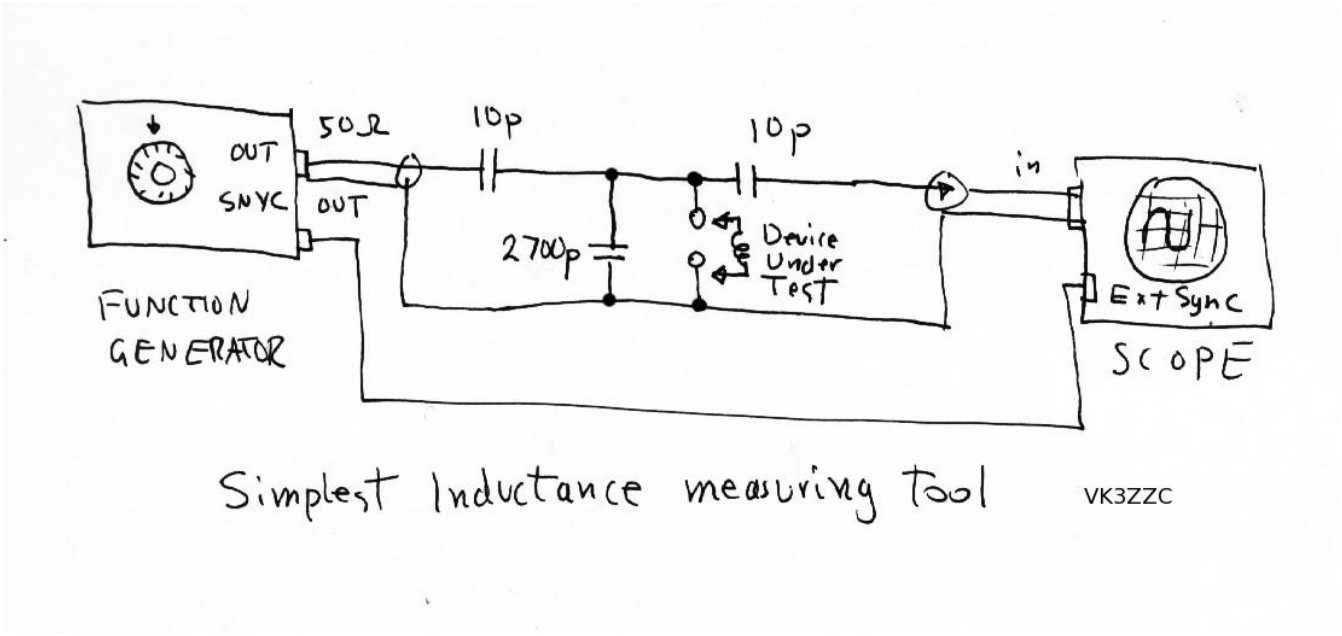

Figure 7 - Simple inductance testing method; credit: R. Klimek[53]

Regarding the diode parameters, this is more or less a skin, muscle, nerve, and fascia conductivity test for semi-conductive properties. It probably would require lab precision. Tissue is not likely to behave like silicon-dioxide or other semiconductors, so it's a threshold value. Remember, some parts of the circuit are symbolic. The other diode is a standin for a sensor. Once a sensor model is discovered and applied to control the potentiometer, there is no need for any diode in that connection. It is a symbol for the reflexive auto-control of channel impedance within local tissue, but which **can be affected distally through the meridian**; possibly via CNS control. Evidence of this is in the miraculous-seeming powers of monks who do feats such as:

[51] https://www.ncbi.nlm.nih.gov/pubmed/12195979
[52] https://www.biorxiv.org/content/early/2018/10/31/343905.full.pdf
[53] http://users.monash.edu.au/~ralphk/inductance-measuring.html

meditate in blizzard conditions[54], defy psychedelic drugs[55], melt stone (figure 8), do death meditations which preserve the body long after death[56], and maybe even go for extended periods of time without food or water.[57]

In the above note's link the assertion is interestingly made that a guru survives on sunlight and a little water. If the author is correct and photons are, after all, electric signal circuits, then this model provides the mechanism to explain the "Supernatural" via electromagnetic means. Also, the "rainbow body" power (siddhi) displayed here in the handprint vitrification is also explained via the amplification of luminous signal. The author makes no claim and includes this merely as a part of the discussion. All untested claims remain unscientific until verified.

Figure 8 - Padmasambhava's Handprint[58], Nepal; credit: DTBA[59]

It should be said that this analog circuit may be totally inadequate regarding the lack of an antenna receiver, and possibly even a transceiver. Signals math is far more complex than Kirchoff electrical equations. Models of this sort will remain out of the author's reach until the analog parameters are well known, and then the project can be managed in computer software at the next stage.

With regard to the current and voltage sources, and to the values of storage capacitance (as a whole), and the battery, it should be said that these are possible to find (mostly as aggregate sums, probably via estimation), but in some cases it won't matter. For example the current and voltage inputs from nerves, vessels, and muscles will change continuously, due to change in tissue type, day, moon phase, health level, nutrient level, activity level, season, introduction of stimulants or depressants, and of course brain chemistry. A range can be selected for testing purposes, the author recommends the well known values of nerve and muscle conduction tests. For the output side, the current controlled voltage source would utilize the same current as the input side, and this would be respective to the smallest nerve branches, with the exception of "extraordinary meridians" (which would use cord strength values within their known nerve tissues) and TMM or luo & divergent channels (which would rely on connective tissue measurements, instead of nerves). All of

[54] https://www.buzzworthy.com/monks-raise-body-temperature/
[55] https://www.ramdass.org/ram-dass-gives-maharaji-the-yogi-medicine/
[56] https://www.youtube.com/watch?v=gtA7BVLD5l8
[57] https://www.thehindu.com/2005/12/10/stories/2005121011610400.htm
[58] http://www.rigpawiki.org/index.php?title=Asura_cave
[59] http://tibetanaltar.blogspot.com/2006/07/this-is-padmasambhavas-handprint-nepal.html

these values would have to be included in a super circuit diagram for the whole body, and a supercomputer would have to calculate the feedback results since analog signals affect the entire circuit (although the amplifiers should isolate it somewhat). This is a TCM property, an unavoidable, even with argument for digitization. There must be a method to link the circuits (channel pathways) because of the interesting interaction of the TCM channels. The following diagram and list of common linkages demonstrates, but is not exhaustive of these connections.

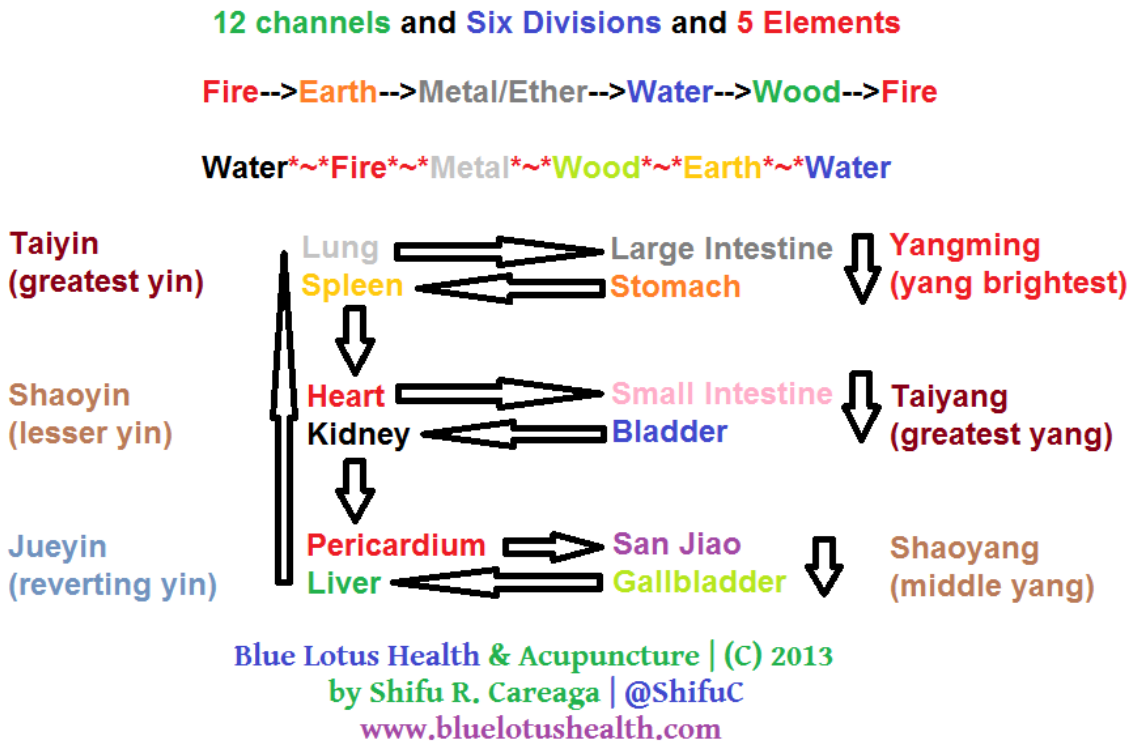

Figure 9 - Five Phases and 12 Channel/6 Division Correspondences; credit: author

Aside from the above there are the following connections:

- Yin/Yang pairing of Viscera and Bowel channels
- TMM, Divergent, and Luo channels for each of the main 12 channels
- 8 Extraordinary meridians with differing internal connections to the 12 channels *and organs*.
- Dermatome and myotome pathways
- CNS connections for each of these pathways
- ENS/PNS and Mesenteric connections to these pathways
- Including of major known Chinese “chakras”, possibly extra ones from Ayurveda if connected to known glands and important structures.

The above is not exhaustive, and could **never** closely simulate the actuality of trillions of cells in complex relationship with each other. But for the rest of the signal noise, which can be assumed to seem basically random or localized, it can be arithmetically added via computer model, or simply ignored. Only in very, very rare cases would a disease be unable to be described or modeled because it was too random. It might even be inconsequential. For example there are skin conditions which may not be easily modeled. Most of them are benign. They are, according to TCM, mostly issues of organ imbalance and blood deficiencies or

heat pathogens. So measurement by external device and input into the model should be sufficient to clear most of them up. As for warts and ringworm, they wouldn't be consequential enough to worry about. But a dermatological condition such as skin-tags under the arms, or melanoma, or fungi in the nail-beds may be signs of deeper pathologies that might be missed. In the case of the latter, it's usually inconsequential, and in the case where it is consequential, there are almost always other channel pathologies that connect it to heart conditions, diabetes, etc…

As for the local capacitors they may be set to a small upper limit of the charge of the muscles, or perhaps the lower limit on the back end and upper limit on the front end (right), signifying a higher drain on the transformer, making it a conservative model. With regards to the battery: whatever charge storage is estimated for the body, the actual value will be 3 to 10x the simulated value[60] at its normal, healthy, max peak[61].

Testing some of the model via computer, some via lab, and some via clinic is likely to slow the progression of this model. However, the dividends paid back to mankind (after so long with a pseudoscientific model) of something tangible, real, documented, and peer-reviewed for thousands of years probably cannot be overestimated. It would benefit mankind in perpetuum. As technology enhances, the model would be refinable to the point of single node testing. An echo signal could be introduced at a famous point such as LI4 to test the entire head region (which it controls), or ST36 to test the core cavities (which it modulates), and a received signal could be used to further refine. If the author's proposed diagnostic device also works as hoped, there would then be a dual method for health and disease diagnostics which could inform a computer.

Discussion of Pulse Signal

Think of it another way. In the past a mysterious diagnostic signal known as "pulse" (mai) was taken via the 3 x 3 x 9 pulse locations. A master, such as Qi Bo of the ancient classic, "Huangdi Neijing Suwen"[62], could listen to these pulses for 30 minutes to an hour, and tell a person about traumas to the body and illnesses many years or decades removed.

Some of that was via intuition or "download," (visions, mirror neuron exchange, quantum bi-location etc…) and some was from a cogent system handed down with case example memory of mechanical pulse patterns and memorized, master to disciple, for hundreds to thousands of years. More contemporarily, Bob Doan (a former Tibetan monk) teaches this method[63]. The author prefers the former as he has no lineage.

Regardless of method, the diagnostic of the "pulse" signal is not merely integer data, or pressure data. But the training required to acquire this diagnostic skill is formidable, and basically **expensive**.[64] Theoretically if medical students started their first year with a true pulse log, they could learn to receive and correctly interpret these signals in clinical practice and use after 10-20 years, depending on wisdom, insight, innate capacity for learning, and access to the control box for their own energies. This is unacceptable. A machine device could

[60] 3: Qi, Spirit, and Essence (the latter are possibly immeasurable if quantum bodies exist, or trans-dimensional spaces are responsible for life *and* consciousness). 10: there are potentially more energy storage centers than discussed, which act as cavities of super-capacitance. So an order of magnitude seems rather conservative than liberal.

[61] Most people are bound to average limits. But history and modern sports is replete of examples of people who defy the odds. In the author's clinical experience, not only have several patients come in with reserves of charge (as Shen/spirit) that defy normalcy, it usually overwhelms the author's own (very sensitive) system. One case was a man struck by lightning 3 times on different occasions. Another, for example, became an olympian and qualified for the 2019 games, as a senior over 55, with minimal training after 35 years out of the chosen sport: track sprint. Both examples were males and in the category known as *excess* (generators) body types.

[62] Author unknown. 2500+ years old. Best translation is by Paul Unschuld.

[63] https://www.youtube.com/watch?v=qadUDMzGpOU

[64] For the author: 5+ years Taiji tuition, and gongfu costs, medical school, and occasional CEUs

do it in seconds, reliably, with cross-reference to billions of cases via digital storage, and could interpret them, and then a well trained clinician can verify the results (and improve their own understanding).

This is but one type of signal. Other signals, such as cardiac waves, brain waves, neurochemical markers, etc… could be introduced. The possibilities would be endless.

Conclusions

The CWT/FC model, proposed by S. Chang, is a useful launching point for the discussion of both TCM theory and electrical behavior in the body. However, it is not quite able to grapple with the finer points of TCM theory, and pathophysiology that is real and clinical. It also may not satisfy biomedical paradigms and case studies. It does not have a method for almost sentient like behavior of the body's tissues.

By looking at the Qi as a form of signal - possibly scalar waves, possibly electrical fields - that is generated through the presence of Charge (movement, accumulation, discharge, and alternating currents) within tissue structures, we are able to generate a fractal (non-linear) analog circuit model which may describe both acupoint *and* meridian theories. It is non specific enough to cover all the types of jing-luo, vessels, fascia, nerves, and matches the criteria for bioenergetic protection and connectivity. The amplification of signal enables a neuron/dendritic expression of action-potential-like propagation (that is: known ion pump mechanisms) downwards, which resists reversal of the flow, but also allows it. It also stores charge and current, and enables multi-phase transformation, though we prefer to summarize the transformation and induction behaviors in values ascertained through clinical establishment and lab work.

Once the values of the circuit are known in all their ranges, the author has a proposed mechanism for actually testing the model to generate behavioral algorithms. These can be strung together in larger and more detailed models that can be used to simulate health behaviors. Cross referencing the signals with diagnostic and health information, models of charge/energy distribution and predictive pattern diagnosis may enable us to make quick estimations of problems, known solutions, or test against traditional, alternative, and complementary medicines for both verification *and* solution search in rare or difficult cases.

When combined with the proposed Electric Field diagnostic methods (et al…) the author proposes a dual diagnostic system that is internal (such as echo signals, or pulse reading, or electric current and induction tests) and external. The entire energetic problem being known, the author proposes (based on his clinical research and experience, as well as a growing body of bioelectromagnetic science) that the entire energetic and mechanical (or chemical) manipulation and solution can be known, within an acceptable margin of error.

In the final analysis, the model must account for oddball situations or evolve. The circuit is analog and not digital, so although it does not buffer against increases in modules (causing drain, feedback, noise, and changing parameters), it will however reflect the fractal/refractory nature of health and medicine **in the real world**. Possibly when certain structures or tissues show exact parameters, portions of the model can be digitized into simple components which reduce computive load/time and reduce the complexity of the larger proposed full-body model.

The author proposes to set upon the road of clinical trial, and that other scientists, practitioners, doctors, and engineers follow this path to eliminating variables, modifying the model and evolving it. Perhaps certain computer science techniques can turn the model into a more predictive one, utilizing AI or bio-computing algorithms which continuously adjust the parameters as complexity is increased. Furthermore a

signals engineer may be interested in developing an antenna/transceiver model based either around the DNA or perhaps, the channels (as wires) behaving like long RF and IR receivers.[65]

The accumulation of charge, and its movement, discharge, or back-wash (noisy signals), may provide the world's first scientific bioenergetic solution to an ages old, increasingly poignant problem in medicine!

[65] A description of proposed lengths, in their limits can be set against ¼ wave calculations to determine with level analysis corresponds to which EMF signal. Obviously DNA being as small as it is should be receiving UV or higher signal. But resonance may enable long RF/VLF reception even in microscopic structures. This is probably a subject for a much more detailed paper and a whole different project!

Epilogue - What are Signals?

RF/EMF

> *"In communication systems, signal processing, and electrical engineering, a **signal** is a function that "conveys information about the behavior or attributes of some phenomenon". A signal may also be defined as an "observable change in a quantifiable entity". In the physical world, any quantity exhibiting variation in time or variation in space (such as an image) is potentially a signal that might provide information on the status of a physical system, or convey a message between observers, among other possibilities."*[66] *(sic)*
>
> *"An **analog signal** is any continuous signal for which the time-varying feature (variable) of the signal is a representation of some other time varying quantity, i.e., analogous to another time varying signal. For example, in an analog audio signal, the instantaneous voltage of the signal varies continuously with the pressure of the sound waves. It differs from a digital signal, in which the continuous quantity is a representation of a sequence of discrete values which can only take on one of a finite number of values."*[67] *(sic)*

This analog signal can be electrical or fluid based.

In the pursuit of our model, one must consider the possibility that charges becoming lodged within the body are not the only means of affecting the body's signal. Radiation definitely has an effect, for example upon the pulse signal[68] in cardiac cases.[69] It is also said that the RF signal known as the Schumann Resonance has a significant modulation effect upon the human body.[70] However, what about RF signals from space, cosmic rays, neutrinos, moon, and of course human-made signals such as wifi, cellular, etc…? There does seem to be an obvious connection between increased city warming and violence. There is likely an effect upon the performance of the transformer effect within the heart or chest, abdomen (and metabolism), and in the circuit of Figure 5. But it isn't clear if the signal will always harm the performance or can it aid it. The author therefore would like to mention the TCM concept from the Neijing-Suwen, the "Tong Shen Ming".

Tong Shen Ming is an outward light-based signal that does not emanate from within the doctor but is released into the room by the doctor. Some type of proposed *quantum shift* is given from the book which states that the chest and gaze of the doctor will determine the health signal within the room and surrounding environment. This is, indeed, the case and is a technique used by the author as a general case but in some particular cases more so. It is, in such cases modulated by the environmentally available photonic electrical signal, which is often down-regulated by overcast or hazy conditions. In the event of lunar increase, either to New or Full moon status, the signal is also enhanced, but its use is different. This, to the author, points to a inner-outer dual-reflective signal transpondence and frequency **and** amplitude modulation.

So the discussion of signals in this schemata proposed above may need to involve not only quarter wave antennas and planar wave calculus, but quantum electrodynamics. If the chest network bundle is modeled as a motor-generator, then it may even be necessary to discuss magnetohydrodynamics.

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[66] https://en.wikipedia.org/wiki/Signal
[67] https://en.wikipedia.org/wiki/Analog_signal
[68] https://www.ncbi.nlm.nih.gov/pubmed/27304979
[69] https://www.ncbi.nlm.nih.gov/pubmed/29595799
[70] http://researcharchive.lincoln.ac.nz/bitstream/handle/10182/3935/90_n1_EMR_Schumann_Resonance_paper_1.pdf

Humanity is not yet at the place of total unification of these fields. We have barely mastered the use of photovoltaic diodes to utilize solar RF in the visible spectrum, for the production of electricity. But we have not even begun to master dynamic antenna production that could replace diodes by capturing all the range of solar RF, and be produced organically or through nano-robots and carbon nanotubes. We cannot yet manufacture those fast enough. So, to this day, semiconductor diodes must be essentially placed in linear arrays. Linear arrays, of course, are limited both in size and density vs. performance. The body, if it utilizes "cable line" connections between a massive complexity of nodes, cannot be possibly modeled with linear arrays. It must be much more like organic (obviously).

DNA as antennae

This cannot be solved without a movement of the goal-line forward in the discussion of biochemical electric circuitry. This isn't a new concept: it is a neglected concept. In biochemistry the emphasis on signals seems to be chemical marker signatures, such as hormones, antigens, ion pumps, neurotransmitters, etc… This is the obvious "billiard ball" mechanistic behavior within the body. But, just as the planets do not exist in particular isolation, held in a clockwork "dead" arrangement by mysterious forces that connect them, neither do the molecules and atoms within the body. There is a full spectra of RF signal emanation and absorption, starting with photonic exchange in chemical reaction, and continuing to inductive and capacitive behaviors within cells and yes, DNA. The DNA itself has the peculiar property as such: the coded DNA is understood through the mapping of the Human Genome Project. But the uncoded "junk" DNA follows linguistic laws such as Zipf's Law. What type of language is it? Without becoming religious, and describing the body's "fate" or "destiny" the author proposes instead that it is the language of electrical signals. Like stars, whose communications and proposed consciousness is unknowable (the volume of signal exceeding human computational ability at this time): the body is swimming with so much minor and major electrical signal, that we cannot possibly receive all of it. Attempts, such as using kirlian photography have been made, and the author has proposed Ef and other visualization methods. But in the end analysis, we just don't have the capability. But that isn't an excuse to ignore it! There are lab evidences of the differences at DNA level of chromosomes[71], epigenes[72], telomeres[73], etc… which match the macro-level evidence that methods which "increase Qi/prajna"[74] completely change the health (blood) numbers[75], thermal profile[76], fMRI brain activity[77], BMI and blood pressure[78], as well as physical appearance[79] (and aura[80]) of the individual (shen/spirit).

The fMRI scans alone demonstrate reliable coherence in the "increased signal" model when compared with thermographic scans. See Figures 10 and 11.

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[71] http://healthland.time.com/2010/12/23/could-meditation-extend-life-intriguing-possibility-raised-by-new-study/
[72] http://content.time.com/time/subscriber/article/0,33009,1952313-2,00.html
[73] https://books.google.com/books?id=j29lDwAAQBAJ&pg=PA97&lpg=PA97&dq=comparing+chromosomes+in+people+who+meditate+and+who+don%27t&source=bl&ots=u5rLxLzk8q&sig=vl3AV0URJfAD9ZkGgBTndGDqBYA&hl=en&sa=X&ved=2ahUKEwj9svvszr7fAhUR3YMKHbWSDXAQ6AEwEnoECAEQAQ
[74] Yoga, qigong, neidan, daoyin, taijiquan, cardiovascular exercise, TM, etc...
[75] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5934947/
[76] https://www.researchgate.net/publication/328436500_Thermographic_Evaluation_of_Mindfulness_Meditation_Using_Dynamic_IR_Imaging
[77] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2944261/
[78] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5433109/
[79] https://www.huffingtonpost.ca/2014/05/14/benefits-of-meditation_n_5324267.html
[80] http://www.ebdir.net/enlighten/bob_swanson_kirlian_photos.html

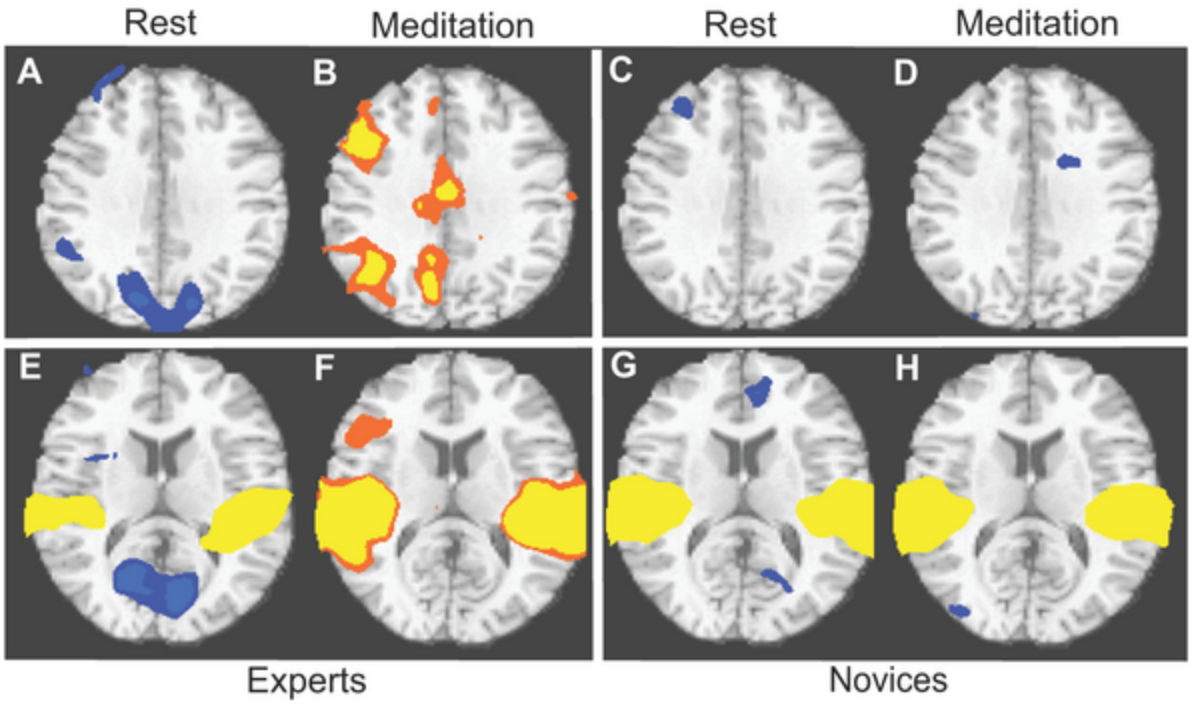

Figure 10 - fMRI in meditation *in situ*; credit: PLOS/Lutz et al...[81]

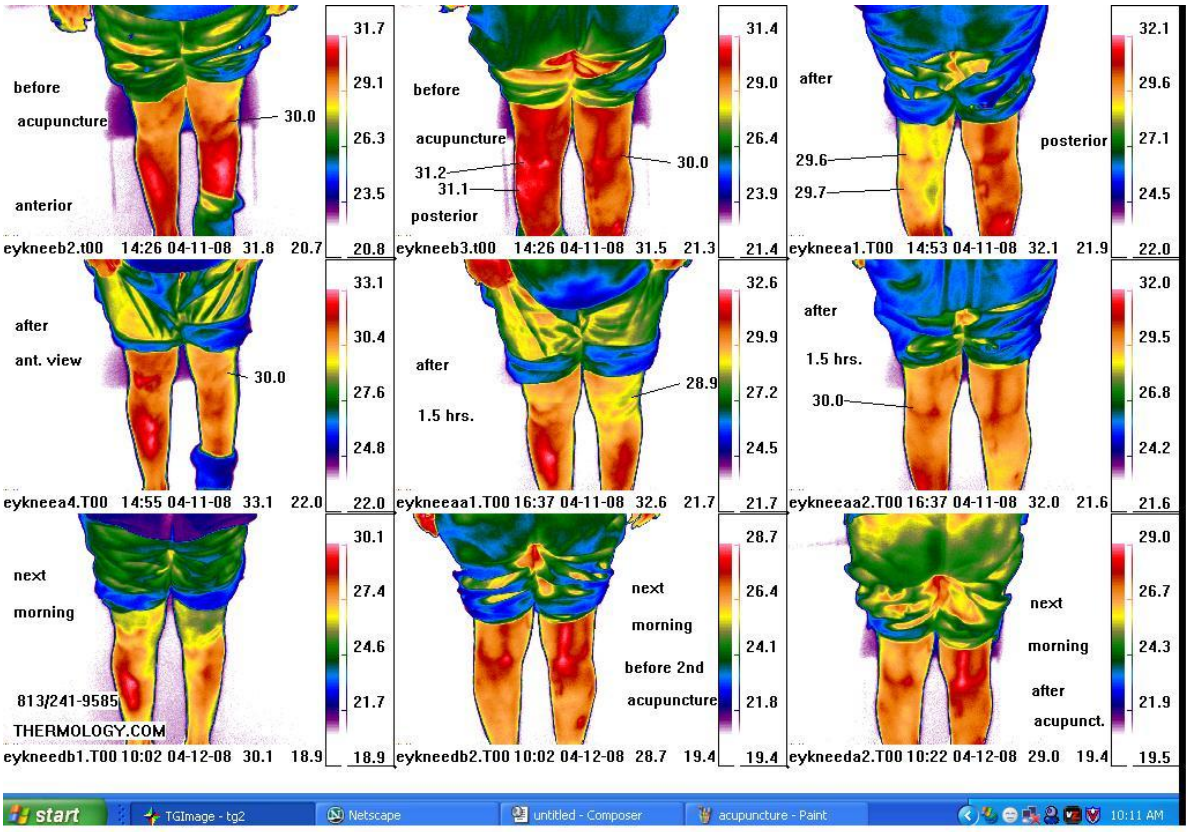

Figure 11 - thermography before, after, and next day; credit: thermology.com[82]

[81] https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0001897
[82] https://thermology.com/thermal_imaging_before_after.html

Water/Black Body

In the case of brain scans, the signal increased, but in the case of thermal signature it decreased. The spread was, however, clearly evident. What's the difference? The mechanism of increase in the CNS is somewhat expected, as meditation, acupuncture etc… are well known to "increase alignment" and alter brain activity. It is precisely what the model predicts. But does the model cover fluid dynamic analog signals? The change in body temperature is related to two factors:

1. The Down-regulation of sympathetic nervous system (SNS) pathophysiological response (almost allergic or inflammation response) to stress and stagnation of CNS and PNS/ENS signals. As the latter increase, the former down-regulates and this stimulates the up-regulation of the parasympathetic nervous system (PSNS).
2. Capillary and vascular dilation and decreased cardiac output. As vessels dilate they spread inflammation out, and the change in #1 causes a concordant decrease in CO. That means less pressure, which means less compartmental pressure, which means less heat. So by stimulating the fluid movement, actually the heat signal decreases.

Could some of the heat have been resorbed? Possibly. But the behavior of the body in this dualistic signal (one electrochemical, one fluid mechanical)leads us to a final discussion of RF signals. There is a very little known and misunderstood property of water in which it may act as a black body. Typically this is in shockwaves, as was demonstrated in H-bomb testing in the Pacific. As the shockwave propagated, so did the black body absorption spectra (turning the water black)[83].

If the human body were to propagate certain small shockwaves, perhaps types of cavitation or electrical sparking, etc… could the water within the body also be a major influence on the health of the signal circuits in their RF reception and transpondence? Or in cellular communication during something important, say mitosis or meiosis? Could the very mechanism of mutation and cancer, or the defeat of incurable viruses such as HIV, hepatitis, etc… lie in accessing signal level control (directed by lasers or sound waves) of microbial sized circuitry (symbolic but functionally parallel)? The author thinks it is within the realm of possibility, and may lay as the final leg of the journey from where CAM and bioenergetics operates now and the end goal of ending pain, suffering, disease, and lowering population pressures by naturally steering humanity away from devastating behaviors caused by resource competition and strife. It could, of course be science-fiction, or dangerous. It may require classification or limited access. It will likely take hundreds of years of modeling and verification. Humanity may not be ready for it.

But if we can activate the healthy water within the body, and read the electrochemical signals of DNA, and demonstrate the behaviors of the electromagnetic auras, is there not any reason we cannot cure problems such as starvation, addiction, obsessive compulsive behavior, bullying, criminal insanity, tyrannical megalomania and fanatical virulent terrorism, needless to say countless other myriad maladies? It is a hope, almost utopian. But all of our enhancements as a species have come from idealistic and technological breakthroughs which overthrew previous limitations and biases. After classical electromagnetism was codified the Industrialized Age exploded and enhanced the living conditions worldwide, but sparked so much energy signal in humanity that populations also exploded. At that time increase meant increase. But perhaps we can actually modulate the human level circuit so that increase might finally mean healthy decrease and for men, women, and elderly everywhere: a much deserved rest and meditation or prayer session, or simply the leisure to pursue inner refinement and enhancement.

[83] https://www.youtube.com/watch?v=i8ijbu3bSqI

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