

Intrinsic fractal structure of signal that triggers Quantum Biophysical Semeiotics Reflex

by Simone Caramel and Sergio Stagnaro

Introduction

Auscultatory Percussion¹, as re-interpreted by Quantum Biophysical Semeiotics [1], is based on the principle that the human body is the paradigm of a marvelous and complex system of information sent throughout the organism under either physiological, pre-pathological and pathological conditions which are conveyed as *nervous inputs*, and caused by stimuli of a physical, chemical, vascular, biochemical and metabolic nature able to trigger tissue receptors - the starting point for 'reflex arcs' ending up in several viscera and internal organs.

'Auscultatory Percussion' is based upon the idea that reality and its knowledge are, in both physiological, physio-pathological and pathological domain, the result of a relationship and an exchange between the information contained in the organs of individual entities - physician's mind and sense system vs. patient's body. This information exchange affords creating a structure able to connect, interlink and penetrating any living thing².

The information circulating through the human body is tightly connected with neuronal activity, that is with the brain, as well as with the relationship between the nervous system and its corresponding **reflexes**³ on mind.

Physical scientist David Bohm considers the thoughts of our mind and thought in general as a system [2]. In order to understand how this system works we have to try to look at it and into it exactly as it is. He suggests looking at it from outside, as if we were spectators of a show. All the thoughts we create are rooted in human mind both as individuals and as community. But this ends up tyrannizing us because our thinking system is full of defects, inconsistencies, discords, conflicts, disharmony and so on, which strengthens and strengthens day by day. Finding a way out of this system that conditions all people, both the seduced and the anesthetized, is not a simple thing, because the system itself cheats us into believing that the thoughts we think are created by us, whereas, on the contrary, a multitude of individuals spend all their life merely replicating everything that has been thought and stored for thousands of years. One may be induced to believe that there is no positive outcome as long as we create hypotheses, assumptions, beliefs, and so on, because all this is pre-confectioned thought as well, meaning that all this is still part of a system

¹ With the aid of such a method, which originated at the end of the XVIIIth century, physicians can evaluate, both on a qualitative and on a quantitative basis, any changes that may arise in the target organs of an individual lying on his back under psycho-physical relaxed condition, as a result of strictly defined stimulation and auscultation methods.

² According to Gregory Bateson 'that broader knowledge', 'that glue that keeps together stars and anemones' is inside both the ones and the others.

³ In physiology, a **reflex** is an involuntary response to a stimulus caused by nervous elements and ending in a response. The purpose of reflexes is usually to maintain homeostasis in organisms. In the animal domain, reflexes are usually a matter of the nervous system or the endocrinal system or either of both.

perpetuating its own self-cheating and prone to keeping up his perverse mechanism. Bohm suggests some methods to consider this inconsistency as from outside.

Bohm says that we should explore our thoughts exactly as Dr. Stagnaro explores the human body, that is without going too deep into them, but only looking at them from a scientific viewpoint. Another method, another vision suggested by David Bohm is to consider thought just as a group of reflexes - usually conditioned reflexes - meaning that all we say is usually a chain of chemical, neurophysiological reflexes and the result of experiences stored in our memory having still an influence on any subject we may deal with.

According to Bohm, every reflex has a structure of its own and thought is a complex system working together with a group of reflexes - thought itself being a very subtle game of potentially endless reflexes. The question aroused by Bohm is: Are reflexes consistent? To answer his question, we have first to remind that thought is a product of the mind. In its turn, the mind is a relational phenomenon arising in and among several entities which are available wherever information is also available - 'a difference engendering a difference', a stimulus that changes its receptor and creates inputs conveyed through the afferent neuron corresponding to the nervous centers and then to the efferent neuron, which brings about a different status in the target organ. According to Daniel Siegel⁴, an American author who sums up the unanimous position of various researchers, the mind is a self-organizing process arising from flows of energy with a particular structure and connecting information to systems able to read it. He suggests thinking about a triangle whose vertices are represented by the brain of one person or the brains of several people, and the relationships occurring between these brains and, finally, the mind emerging from these two big equally complex organized systems, and ruling over them.

A typical feature of man, made possible by a pre-frontal cortex function, is the mind reflecting upon itself (proprioception⁵, mentalization or mind-sight), which affords us to talk about

⁴ Most of Siegel's intuitions came from Mathematics. He had the insight that the mind complies with the mathematical definition of a complex system because it is open (it can influence the environment outside) and it is featured by non-linearity and deterministic chaos behavior (meaning that a slight input can arouse great, unpredictable results). In Mathematics, complex systems are self-organizing, and Siegel thinks that this principle is the very foundation of mental health. Mathematics teaches us that an optimal self-organizing system is flexible, adaptive, consistent, energized and stable. This means that, if our self-organizing system is faulty, we end up in stiffness and even pathology - a matter of fact that, according to Siegel, is strictly related to a series of symptoms for mental health disturbs. Moreover, the organizational principle on which organization is based tries to connect different ideas or, basically, to integrate them with one another. That's why, Siegel says, when brain or society are concerned, integration is the very foundation of a healthy mind.

Another key point of his reasoning is that society today is miserable and that this is due, at least partly, to the way our mind perceives things. In fact, while he was working in Namibia as a researcher, he noticed that people he met said that they were happy because they felt they belonged to their community and environment. But when they asked in turn whether Siegel felt this sense of belonging to America, his answer was less optimistic: "Well, actually I was thinking how we're all so alone and, in a way, disconnected from one another". "Our modern society leads us to the persuasion that the mind is pure cerebral activity, meaning that the Self, that comes from the mind, is separated and that we don't belong to it. But the truth is that we're all part of other people's life. And the mind is not pure cerebral activity, either. When we become aware of this relational process, we are able to catch sight of our sense of belonging as well". In other words, the only fact of perceiving our mind as a mere product of the brain, instead of seeing into the relationships of our mind, can cause us to feel as if we were separated from the others. And to appreciate the advantages of interrelationships, we just need to open up our mind.

⁵ Proprioception (also known as kinesthesia) is the capacity to sense and recognize the position of our body in the environment and the state of contraction of our muscles, also without support by sight. Proprioception plays a key role

structuring or re-structuring of the mind. This is due to the fact that our past experiences can be imagined as a discontinued tissue made up of several mental states, and every person has a specific *set* of mental states. We are able to reflect on them, and re-organize these mental states, which represent the level preceding the mind. In its turn, the mind is able to reflect on itself and re-energize itself, re-structure itself. Every structuring or re-structuring matches with a neurological structuring or re-structuring, because we are talking about neural networks between neurons which are created in succession. The brain is made up of a hundred billion of neurons, with each neuron creating ten thousand connections with other neurons and an inconceivable series of networks which are formed inside each one of us. The atoms of the universe altogether cannot reach up to the number of possible networks that each of us hosts inside his own brain, and neither can they reach up to the number of organizational *patterns* that the brain of a single person hosts within itself. [4].

Now, whenever any specific problems or inconsistencies related to mental functions come along, we can simultaneously observe some alterations (complexity loss) in some organizational *pattern* on the neurological level. Consequently, this pattern needs re-structuring on a physiological basis by looking into and acting back on the primeval causes that triggered such dysfunctions, in order to recover the lost complexity (re-structuring) or creating it afresh (structuring): and that is the answer to Bohm's question!

Thought reflexes are consistent when their structure is also "physiologically" consistent, i.e. when their structure is - according to the mathematical branch studying nonlinear systems - cohesive, compact, adaptive, flexible, stable, open, open to learning, sensitively dependent on initial conditions, that is where indivisibility, cohesiveness and complexity are one. Vice versa, in case of stiffness, discord, preconception, prejudice, slowness of mind, close-mindedness, hardness and lack of docility, attention and listening disposition, then all this is an indicator of inconsistency.

Speaking in metaphors, we have to re-energize a cloud that has lost its harmony, unity, complexity, consistency, beauty, stability and compactness - in other words, that has split up into pieces - so as to re-create positive conditions for rain, water and life.

If we carefully consider such complexity and dynamics of structures under examination, it is quite obvious that the entire whole is by far superior to the sum of its parts, and that it goes far beyond the typical still reductionist approach 'dividi et impera' of our current simply deterministic scientific method. The correct approach, or cognitive model, to investigate both into the mind and the body must necessarily be complex, biologic-molecular, globally comprehensive and not reductive, meaning that it shouldn't exclude simple and predictable processes from complexity which actually includes them, but on the contrary it should accept the challenge (i.e., the issue) that the word complexity implies and means: it should be oriented to the route rather than the final target, and consider that intermediate milestones on the route may possibly be attained, but they are

in the complex mechanism of movement control. This function is possible due to the presence of specific receptors, the so-called proprioceptive or kinesthetic receptors, which are sensitive to body posture and body segment variations and send their signals to particular areas of the brain. Proprioceptive receptors are made up of nervous terminations which trigger the neurophysiological process of proprioception. These receptors send impulses which are conveyed through the spinal marrow to the brain areas involved in the processing of information about position and movement (for example, pre- and postRolandic circumvolutions) that are necessary for the correct execution of the movement itself.

at the same time both targets and new starting points for other adventures of the mind. (Extracts taken from the manual on Stomach Auscultatory Percussion).

Just as David Bohm investigates into our mind, so does Dr. Sergio Stagnaro into our body - he examines the human body when influenced by reflexes triggered by physician. 'Auscultatory Percussion Reflex Diagnostics', of which he is the founder, is based on data provided by 'Auscultatory Percussion', and in particular on reflexes⁶, both physiological and, above all, pathological. These are skin, muscle and viscerovisceral reflexes, triggered by manual stimulation of the *trigger-points* involved (i.e. points concerning target organs), offering qualitative and quantitative parameters which give us key information in view of evaluation and diagnosis. According to Stagnaro, the easiest and most suitable visceral segment to isolate in the 'Auscultatory Percussion' method so as to obtain a quick and sufficiently information-full reflex diagnostics is the big curve of the stomach.

Using the QBS method, physician can trigger reflexes by either tapping on the spleen, the heart, the liver, the biliary tract, the cecum, the ureters, but the stomach has always had a special fascination for the Italian scientist. When a strong emotion overwhelms us, our stomach aches. This means that each part of the human body, that Stagnaro has always considered as the best one among existing cybernetic structures created by God, must be connected. There must exist a structure made of reflexes transmitted by the nervous system and, maybe, "energy channels" of which we still have

⁶ In human physiology we call 'reflex' a stereotyped motor or secretive response featured as "everything or nothing" arising automatically with short latency time in response to a specific sensorial stimulus. In most cases, reflexes play a protective role or either they allow repeating simple stereotyped motor behaviors without requiring the intervention of higher levels of nervous system integration. The path that nervous impulses follow from receptor to effector through the central nervous system builds up an elementary neuronal circuit called 'reflex arc'. **Reflex** arcs can be extremely simple, such as in monosynaptic reflex (for example the sprain reflex like the patellar's, that arises when tapping on a specific point on the knee), with one single synapsis placed between the primary sensorial neuron coming from the neuromuscular fuse and the single neuron innervating the same muscle stimulated by the sprain. On the other hand, reflexes can also have high complexity levels such as in automated motor behaviors responsible for locomotion or in reflexes that adapt the respiratory rhythm to organism exigencies. Reflexes can be classified into unconditioned (they are innate; the seat of the reflex arc is in the marrow or the encephalic trunk and the motor behavior sets in following sensorial stimulation without intervention of the cerebral cortex) and conditioned (they are related to superior functions of the cerebral cortex, such as learning and memory; a typical example is the secretion of saliva following visual stimuli (e.g. mouth watering due to the sight of food). Motor neurons receive **signals** directly or through interneurons from afferent fibers of primary sensorial neurons (bipolar neurons, whose cell body is in dorsal root ganglia) which come from spinal nerve dorsal roots conveying them **information** gathered at muscle and skin receptor level. The same motor neurons also get in touch with fibers descending from superior segments of CNS (Central Nervous System) with motor function (area 4 of cerebral cortex, red nucleus, vestibular nuclei, etc.). Neuronal networks are therefore quite simple at spinal marrow level and have the following features: a section for sensorial information input, a section of processing which integrates this information with signals coming from other areas of CNS and a section for motor output which triggers muscle effectors. These fundamental features of neuronal networks (input, processing and output sections) can be found at a progressively higher level in all centers and structures of the nervous system up to the cerebral cortex, where granular and pyramidal neurons are organized into 6 interconnected layers. Granular neurons receive information from other cortical areas or lower sections of the nervous system which is re-transmitted almost exclusively from thalamus. This information is processed and re-transmitted producing descendent output signals or signals for other cortical areas in pyramidal neurons. The potentials generated in sensorial receptors of the different anatomic districts enter the cerebrospinal axis through sensorial and mixed nerves (31 couples of spinal nerves and 7 couples of cranial nerves convey sensitive fibers): fibers start forking right here and get connected to many other motor neurons or interneurons and they trigger reflex automatic responses in a great number of effectors. Sensory pathways are organized into 3 neurons: the first neuron conveys information to CNS, the second conveys it to thalamus, the third to cerebral cortex in a specific area for every sensorial mode involved.

little knowledge, originating from various points in the body and converging centrally in the stomach.

These well-shown events can be explained by the fact that the stomach is governed by two gastric nervous plexuses, one above and one below, which in turn are related to the solar or coeliac plexus: solar, most obviously, because it is at the center of the 'universe' man.

In the Sixties, scientists discovered a specific gastric reflex, i.e. the change in volume arising in the stomach due to the onset of several pathologies, such as appendicitis, renal colic, hepatic colic. Physicians can detect this by correctly applying a digital stimulation, for example, a pressure stimulation: while visiting an individual who suffers from appendicitis, physician should apply a digital pressure of average intensity (500 dyne/cm.²) over the appendicular skin projection, and while tapping on the big curve of the stomach, he will observe a stomach expansion and immediately afterwards a tonic contraction: a QBS sign for Appendicitis.

Practically speaking, the application of Auscultatory Percussion includes three consecutive steps which are equally important for its correct execution, and which are expression of the internal and external consistency of this method:

- A) production of sound waves by direct and slight percussion on the skin, with the middle finger slightly bent in form of a hammer;
- B) transmission of sound waves through tissues of different acoustic impedance;
- C) auscultation of sound waves previously triggered and transmitted, by means of a stethoscope.

While looking for a QBS sign, physician applies a pressure stimulation of well-defined intensity on a *trigger point* (eg. on precordium). This stimulation causes tissue acidosis in the related parenchyma, which gradually increases until reaching a critical threshold.

When the acidosis level is reached, **a signal is triggered** which spreads all over the body. Physician starts Auscultatory Percussion, of stomach for example, and senses and measures the reflex caused by that initial stimulation (volumetric space-time modification of the stomach quantified with qualitatively significant parameters such as latency time, duration and intensity of gastric reflex, in this case).

The fundamental question we're trying to answer to in this article focuses on the signal that induces the reflex, and is the following: What is the nature of QBS signal, i.e. what is the intrinsic structure of the signal triggered by stimulation which in the end causes the reflex?

In technical literature, various articles measure and try to interpret human body's signals, for example his electric signals. The list includes studies on ECG and the analysis of HRV time series in cardio physiology [5-13]; the analysis of EEG signals in epileptic [14] and schizophrenic patients [15-18]; the non-linear mathematical analysis of gastric signals measured with EGG (electrogastrography) [19, 20].

The results of these studies, which are applied in all branches of Medicine using different statistical evaluations, in particular by studying the structure and non-linear dynamics of these signals, agree and converge on the fact that signals are fractal, have a chaotic-deterministic nature

under physiological conditions, whereas they tend to linear regularities (loss of complexity, i.e. loss of entropy and information content) under pathological conditions.

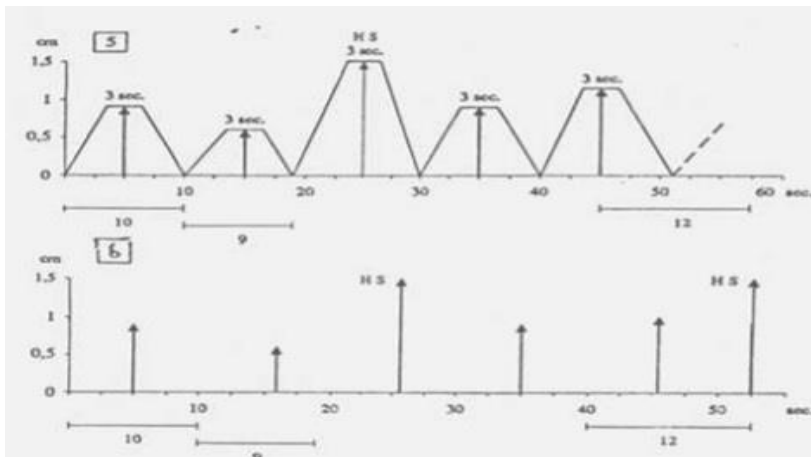
Following these researches, let us now explore the nature of the signal which triggers QBS reflex.

Working assumption and clinical and experimental evidences of Quantum Biophysical Semeiotics

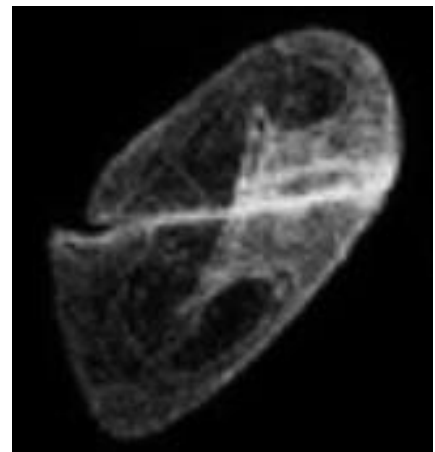
The purpose of this article is to investigate into the intrinsic structure of QBS reflex, i.e. of the signal which triggers Quantum Biophysical Semeiotics reflex.

Our initial working assumption will be that the signal structure of aspecific gastric reflex is parallel and consistent with the attractor structure of the corresponding microcirculatory oscillations that can be observed by evocation of ureteral reflexes [21].

In a healthy individual, physiological microcirculatory oscillations are non-linear, aperiodic, unpredictable, of a chaotic-deterministic nature (Picture 1), and they are structurally mirrored by a “strange” attractor, a balance type as outlined in Picture 2.

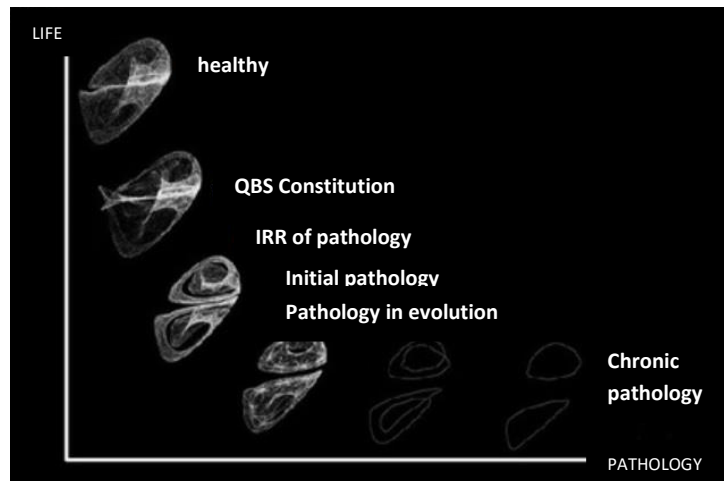


Picture 1. Physiological microcirculatory oscillations in a healthy individual



Picture 2. Equilibria termed Strange attractor

In an individual with QBS constitutions or inherited real risks we observe that its corresponding micro vascular oscillations are less complex and also that the more a pathology evolves from its initial stage, the more these oscillations become regular, periodical and therefore predictable (Picture 3).



Picture 3. “Strange” attractor loses its complexity as it progressively develops into pathology

QBS theory [22] teaches us the existing connections and interactions between parenchymal dynamics (parenchymal activations) and its corresponding microcirculatory dynamics (microcirculatory activations), and informs us on the relationships between the parameters of a specific gastric reflex and its corresponding micro angiology parameters.

Reflex duration, for example, is connected to the chaotic-deterministic structure of micro angiology oscillations and of Microcirculatory Functional Reserve: it acts as a mirror, and it thus mirrors the information contained in the signal. What is a signal? What is the structure of the signal that triggers the reflex?

The electrical signal, for example, is basically a physical quantity whose variation in time conveys an information. Electromagnetic fields are everywhere in human body, and their signals convey the information, they are essentially waves which differentiate by length, frequency and width.

What is an electromagnetic field? Around 1870 Maxwell gained insight into the existence of a phenomenon which was still unknown at that time: electromagnetic waves. In intuitive terms, Maxwell’s reasoning was as follows. A variable electric field⁷ creates a variable magnetic field⁸ (generalized Ampère’s theorem) which in turn creates a variable electric field (Faraday-Neumann-Lenz’s law) and so on. The oscillation of an electric field, i.e. the variation of a field intensity in a particular spot at time varying, causes oscillation of a magnetic field in nearby spots and so on: oscillation spreads in the space in form of an electromagnetic wave.

⁷ In physics, an **electric field** is a force field created in space by the presence of one or more electric charges or of a magnetic field varying in time. In association with the magnetic field it forms an electromagnetic field, responsible for electromagnetic interaction. Introduced by Michael Faraday, electric field travels at light speed and applies a force on any electrically charged object. In the international system of units, measures are expressed in newton/coulomb ($N C^{-1}$), or in volt/meter ($V m^{-1}$). If generated only by the stationary distribution of spacial charge, an electric field is called an electrostatic field and it is of a conservative type. Distribution of electric charges which are stationary towards the observer generates - in a specific spacial spot - an electric field whose module, direction and versus do not vary in time, i.e. a **stationary** electric field. An electric field which is no longer stationary but variable is called variable in time.

⁸ In physics, with particular regard to magnetism, **magnetic field** is a solenoidal vector field generated in space by the movement of an electric charge or by an electric field variable in time. In association with the electric field it forms the electromagnetic field, which is responsible for electromagnetic interaction.

Unlike mechanical waves, which can only spread along elastic instruments, electromagnetic waves also spread in space void of matter. In electromagnetic waves, in fact, no material instrument oscillates, but the intensity of electric and magnetic fields does vary in space and time. According to his theoretical calculations, Maxwell deduces that light is made up of electromagnetic waves. The existence of electromagnetic waves was experimentally demonstrated by the German scientist Heinrich Hertz (1857-1894) in 1888.

Any electric charge which is accelerated generates an electromagnetic wave. The frequency of an electromagnetic wave is defined by the oscillation frequency of electric charges in the wave source. More precisely, in every spacial spot the electric and magnetic fields of an electromagnetic wave oscillate in phase with the same frequency f , equal to the frequency of the generator which supplies the circuit of the emitting antenna. For example, radio and TV signals are made up of electromagnetic waves. When waves reach a receiving antenna, they interact with the electric charges existing in the wires of the antenna.

Like any periodic wave, an electromagnetic wave has a frequency f and a wave length λ which are related to speed v of wave propagation. The orderly series of frequencies or wave lengths of electromagnetic waves is called electromagnetic spectrum (for example, electromagnetic spectrum in a huge frequency interval, from less than 10⁴ Hz to more than 10²⁴ Hz). The relationship between f and λ can help determine the corresponding interval of wave lengths. In historical terms, the spectrum regions were called radio and infrared waves.

Radio waves (with wave lengths varying from some dozens of kilometers to 30 cm) are used for radio and TV transmissions and are generated by oscillating circuits. Micro waves (with wave lengths varying from 30 cm to 1 mm) are used in several domains, for example in mobile market: a mobile phone emits waves of about 900 MHz frequency, that is with a wave length of 30 cm.

Infrared radiations (with wave lengths varying from 1 mm to 750 nm) are generated by vibration and rotation of molecules inside a material. When our skin absorbs infrared radiations we feel heat. There exist specific systems which afford seeing infrared radiations emitted by a body: an appropriate code allows associating a particular color to each temperature, thus realizing ad hoc pictures.

An infrared thermometer measures body temperature by measuring the quantity of infrared radiation emitted by the eardrum and the surrounding organs. The ear⁹ is one of the most suitable organs for body temperature measurement because it is near the hypothalamus, the brain area which regulates body temperature. Furthermore, the ear experiences no cooling or heating process during normal body functions such as eating, drinking or breathing. When the temperature probe is inserted into the earing canal, infrared radiation influences the probe, which gets heated and changes its resistance. This variation is measured by an electronic circuit, which detects body temperature and shows its results on a digital display.

⁹ The ear perceives sounds in a fractal way, explains P. Plichta in *God's Secret Formula*. Piemme, 1998.

Just like water waves and sound waves, electromagnetic waves are also conveyors of energy. And this energy is conveyed by the electric and magnetic fields which have created the wave.

However, to come back to our subject, Quantum Biophysical Semeiotics is based upon the Auscultatory Percussion method. Physician stimulates the trigger point involved, e.g. by tapping on precordium – to check for the healthy state of the heart – with one finger and with the other hand he slightly taps near another organ – for example the stomach – and then listens to what happens next.

The performing of Auscultatory Percussion maneuver triggers a signal – the result of a pressure stimulation on a trigger point, e.g. on precordium, which is the skin projection of the heart. When this signal reaches the place of Auscultatory Percussion (e.g. the stomach), it cannot be considered as an intrinsic expression of the organ or viscera being auscultated (e.g. the stomach), but of the biological information field concerning the spot where the signal was triggered (in our example, the heart), which after pressure stimulation grows larger and spreads throughout the organism.

Skin stimulation on trigger points generates a signal which in turn creates a reflex. Signals are waves that convey information and our aim is to investigate into the structure of the signals arousing reflexes, i.e. causing a movement in the organ being tapped on, as a consequence of an initial stimulation (on a trigger point). If we take, for example, the stomach, examiner will gather data from its movements in space and time. These will coincide with the reflex parameters, not the reflex structure, but nevertheless they can provide us with useful information on the structure of the signal which caused the reflex. In an analogous way, in a bubble chamber you can see neither the electron nor its structure – you can only detect the trail it leaves behind, and this is due to physical and measurement limitations.

David Bohm presumes that the electron has no punctiform structure, i.e. that it is not a dot. On the contrary, he thinks it has a complex structure, in fact it conveys astonishing information. How can this information be imprisoned – he wonders – in such an infinitesimal dot as conceived by Democritus's atomistic thought?

Similarly, we can presume that the structure of the QBS reflex, or better of the signal triggering the reflex, is complex, and that its complexity is strictly correlated, parallel and consistent with what is measured, for example, in the corresponding microcirculatory oscillations (Table 1).

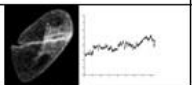
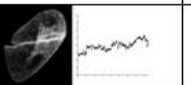
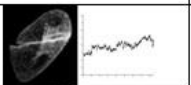
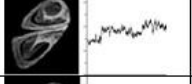
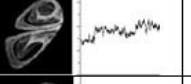
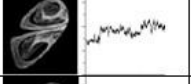
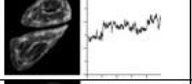
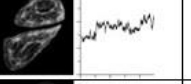
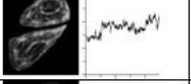
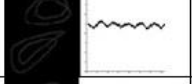
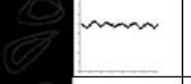
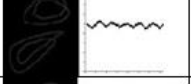
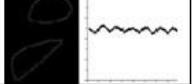
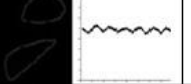
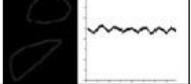
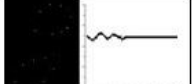
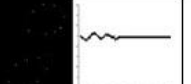
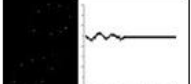
Information Biological Fields	Signals	Energy	Microvessels	fD	Entropy/ % Information	Duration RGA	Diagnosis
		$EI(f) + EV(f) + EM(f)$		3.81	$E > 0$	$D = 3.80$	Healthy
		$EI \searrow$ $(EV+EM) \nearrow$		3.00-3.50	$E \geq 0$	$D \geq 4.00$	QBS Constitution
		$EI \searrow \searrow$ $(EV+EM) \nearrow \nearrow$		2.5 – 3.00	$E \geq 0$	$D \geq 4.00$	IRR of pathology
		$EI \searrow \searrow \searrow$ $(EV+EM) \nearrow \nearrow \nearrow$		2.00-2.50	$E = 0$	$D > 4.00$	Initial Pathology
		$EI \searrow \searrow \searrow \searrow$ $(EV+EM) \nearrow \nearrow \nearrow \nearrow$		1.50-2,00	$E = 0$	$D \gg 4.0$	Pathology In evolution
		$EI \searrow \searrow \searrow \searrow \searrow$ $(EV+EM) \nearrow \nearrow \nearrow \nearrow \nearrow$		1.00-1.50	$E = 0$	$D > 5.00$	Chronic Pathology

Table 1. The fractal structure of the electromagnetic signal triggering quantum biophysical semeiotics reflex progressively loses complexity moving from its chaotic-deterministic peak (physiologically, in healthy individuals) down into a simultaneous reduction in fractal dimension during the slow pathological progress: from merely potential (pre-clinical phases, QBS constitutions and IRRs of pathology at different stages) till onset of various clinical stages (initial pathology, pathology in progress, chronic pathology). While performing Auscultatory Percussion maneuver, pressure stimulation on the trigger-point involved causes an expansion of the biological information field transmitted by its electromagnetic field, so that its wave signal spreads throughout the body. Aspecific gastric reflex shows a physiological duration between 3 and 4 seconds, which is parallel to chaotic-deterministic micro vascular oscillations with a fractal dimension equal to 3.81. Duration is equal to or more than 4 seconds when signal loses complexity (and simultaneously loses Entropy and Energy-Information EI) moving through non physiological stages, both pre-clinical and clinical, which is simultaneously accompanied by a reduction in complexity of micro vascular oscillations, whose attractors turn from chaotic into limit-cycle or even fixed-point in chronic diseases.

Legend: fD = fractal Dimension; AGR = Aspecific Gastric Reflex; QBS = Quantum Biophysical Semeiotics; IRR = Inherited Real Risk; EI = Energy-Information; EV = Energy-Vibration; EM = Energy-Matter; E = Entropy; % Information = information rate.

With QBS instruments and the use of a simple stethoscope, we cannot observe intrinsic structure of QBS reflex, that is of the reflex itself, but we can however presume that it is quite similar to the structure of a chaotic attractor if micro vascular oscillation is of a chaotic-deterministic type, and that it has a reduced complexity, that it is more simple (limit-cycle, periodic, fixed-point) if microcirculatory oscillation shows a pathological IRR or a pathology in evolution.

We may therefore presume (theoretical QBS) that the structure of microcirculatory oscillations mirrors the structure of the signal that produces them.

Verification of such a hypothesis is left to experimental QBS or to whoever may or will show that it is wrong by scientific measurement of the signal induced, as written above.

The structure of QBS reflexes is basically Energy-Information, as demonstrated by Psychokinetic Diagnostics: a part of a matter is made of one billion of energy. With regard to the unconceivable to be conceived, we can recall Heraclitus's words ("You will never find truth if you are unwilling to accept even what you hadn't been expecting") and also Heidegger's ones: "das Ungedachte im Denken zu bringen (thinking the unthinkable)".

Dt. Stagnaro has been exploring the human body, both healthy and sick, with great humbleness since the '50s, with a mind void of prejudices or preconceptions.

The signal triggered by stimulating a trigger point induces a certain reaction in the stomach (eg. expansion duration). In a certain way the stomach reflects the information contained in the signal, focuses on it, makes it explicit. The signal is therefore certainly a wave imbued with information, it is certainly matter-energy-information, but it is organized according to a certain structure which travels throughout the body in form of a wave.

Sticking to the example above, the stomach can react differently, depending both on the strength of stimulation and the person being examined. So it is easy to understand that the signal structure can vary, and differ from case to case.

Further below we will try to find out whether the stomach reaction (eg. its duration, the parameter which is most strictly connected with the chaotic-deterministic structure of microcirculatory oscillations and therefore of the Microcirculatory Functional Reserve) acts like a mirror, i.e. it mirrors the information contained in the signal.

For example, a slight intensity pressure - 300 dyne /cm.2 -, when applied on precordium of a healthy individual, after an expansion of only the upper ureter, lasting 6 sec. and consisting of 2 steps (I step = micro vascular compression; II step = micro vascular opening and return to basic diameter) causes oscillation (vasomotility) of the upper part of ureter (= peripheric heart, according to Allegra). Diastole lasts 6 sec. under rest condition, followed by quick systole for a total of 6 sec.

Precisely at this point (where expansion of third low ureteral..., or vasomotion, is not important now), i.e. during systole of peripheral heart, we apply a medium digital pressure (500 dyne /cm²) on precordium (in a nearby area!). During Latency Time of Aspecific Cardio-Gastric Reflex, local micro vases stay still: the third superior is still, but after exactly 8 seconds (Latency time = 8 seconds), the Aspecific Cardio-Gastric Reflex appears, as already known. Simultaneously, in the third upper ureteral, we observe that a diastole stronger than the basic one appears (a stronger diastole means that upper ureter expands further: 3 cm, not only 2 cm. Duration is basically the same, lasts 3 sec. and is followed by systole (lasting 3 seconds, too), but contraction of third upper ureteral is equal to 1 second): reflex duration in the healthy individual is physiologically between 3 and 4 seconds. The stronger diastole is due to microcirculatory reflex, known as venous-vascular-motor reflex, caused by tissue acidosis after 8 seconds in exchange vessels, that is capillaries and post-capillary venules.

This QBS clinical evidence instinctively reminds us of an example of conditioned reflex provided by David Bohm while talking about a test of Pavlov's. This test was performed on the evidence that a dog's mouth usually waters when he catches glimpse of food (watering is in fact a reflex). Now, Pavlov's test consisted in tolling a bell each time the dog was fed. Then, after a certain number of days, the dog wouldn't be fed any more when the bell was tolled. Well, the test showed that the dog's mouth would continue watering each time he heard the bell toll, although he wasn't simultaneously fed any more, and this is an example of a conditioned reflex.

This dog had developed a conditioned reflex induced by physician, who had therefore created a certain signal, with a certain structure, which triggered a watering reaction in the dog, as if he were seeing food at that moment. Similarly, when stimulating the stomach with a medium intensity during a peripheral heart systole, the real stimulation is learnt and stored. The bell toll triggers mouth watering.

In the QBS clinical evidence described above we cannot talk about microcirculatory activation due to the second stimulation on precordium, because whenever we want to trigger a reflex by means of a medium intensity pressure, we reduce microcirculatory flow in the corresponding tissue of the *trigger point* (therefore we won't trigger it!), as demonstrated by the appearance, after latency time, of Aspecific Gastric Reflex, which is an expression of tissue acidosis.

The signal whose structure is supposed to be of a certain type contains information (signal is **matter-energy-information**). The energy conveyed is both wave and matter, but matter is structured and its structure contains the information conveyed.

If we modify the structure, we modify the information, too. Or it can also be the other way round: if we modify the information (eg. by means of Restructuring Mitochondrial Quantum Therapy [23]), we modify the signal's structure, that is the structure of the underlying biological information field, and therefore the genomic structure upstream (whose signal is what we see downstream). In this way, according to our hypothesis, the structure is turned back into its chaotic-deterministic original features, and in this case restructuring is completed, and a physiological signal is restored (eg. after 9 months).

With Marina experiment [24], the modification in the **structure** of an individual caused by the **energy** provided by physician is transmitted to people nearby as **information** which modifies its structure!

By stimulating *trigger points* using thought [25] and then gradually reducing stimulation, always with thought, below 300 dyne/cm², we can practically see what usually happens in the presence of a candidate: slight pressure (= 300 dyne/cm²) will stimulate micro vessels and allow studying their dynamics by means of ureteral reflexes. If pressure falls further, nothing will happen. If stimulation grade tends to zero, signals will also tend to disappear. We could presume that, no matter the stimulation (which can be applied or not), every little part of our body receives signals from any other part of our body. If this assumption is true, every cell in our body is aware of the healthy state (or pathological state or IRR of pathology, or constitution etc.) of any other part, specifically because every part of our body is continuously informed. Due to Heisenberg's uncertainty principle, it is difficult, if not impossible, to verify this theory. Nowadays we can observe **structure** modifications which are consequent to modifications **induced** with the known maneuvers requiring application of **energy** (force being applied to stimulate *trigger points*), which can turn into **information**, as in Marina experiment. Nowadays we aren't aware of the alteration marks of those *natural* signals that we can only observe as effects. We can see the structure and function of glycocalyx, but we cannot catch insight into the nuclear and mitochondrial stimulations that created it.

In our survey on nature and intrinsic structure of the signal inducing the reflex, it is important to take into account biological information fields [24]. QBS clinical and experimental evidences show that these fields pulsate like plasma, and that they physiologically have a fractal structure.

Thinking about what physician does when looking for a QBS signal, that is a pressure stimulation of varied intensity (I = slight; II = moderate; III = medium; IV = intense and V very intense; respectively: 300, 500, 700, 1.000 and 1.500 dyne/cm²) on a trigger point, we can state that this action, for example a pressure on a precordium point, will increase tissue acidosis, which gets worse and worse until a certain threshold is reached. Reaching this threshold, which can happen simultaneously or after 16 seconds in case of stimulation (for example, intense pressure); or physiologically after 8 seconds in case of medium pressure) triggers a signal which spreads throughout the body.

Now, this signal, which spreads throughout the body, can be thought of as a field, not as a vector, because it goes everywhere. This means that it doesn't spread as a line or an isolated wave, but as an all-direction wave, in fact it can be heard by tapping on stomach, spleen, pancreas, liver - anywhere - and every sign detected on different positions is consistent with any other sign. It is therefore always the same sign and the same field.

We can figure out a signal as a biological information field transmitted by weak electromagnetic fields [24] and spreading all through the body (due to pressure stimulation, for example on precordium), like a stone thrown on a pond causing a circular wave chain getting wider and wider and spreading in all directions. Biological information field is physiologically fractal [24], so the intrinsic signal structure, if it transmits a physiological information, i.e. information on absence of pathologies, QBS constitutions, or IRRs of pathology, will therefore be fractal (with a physiological fractal dimension above a certain threshold, eg. $fD = 3,81$), and chaotic-deterministic.

Here I outlined, from a different theoretical QBS viewpoint, how signal's intrinsic structure, that is the structure of this matter-energy-information spreading throughout the body, should be.

There are other similar examples, such as the fractal structure of Masaru Emoto's [26] water crystals (after receiving information from various sources) as well as the fractal structure of electromagnetic signals available in the water structures of the living beings [27], where a mathematical theorem connects fractal theory with consistency theory. A fractal is a mathematical structure with peculiar features, such as auto-similarity and scale invariance. A fractal structure can be associated with a consistent state considering dynamics of system elementary components. There is therefore a relationship between fractal structure and system consistency.

From field quantum theory we deduce that:

- a) A living being is a hierarchical structure of consistent areas, each one contained in the previous one (organelles, cells, organs, tissues, organisms, species, ecosystems);
- b) This structure is paralleled by a similar structure existing in liquid water (molecules, consistency domains and their related domains, etc.);

- c) The existence of this hierarchy of consistent structures seems to parallel the existence of a fractal structure in living organisms.

Hypothesis c) has been mathematically demonstrated [28, 29]. Every system containing a fractal mathematical structure has mathematically been proven to be a consistent system, and that consistency in living beings exists (they are consistent). Watery structures play a key role in supporting their consistency. Summing up, weak electromagnetic fields convey information through wave signals, have a physiologically fractal structure and these structures are consistent (consistency domains).

By using Quantum Biophysical Semeiotics, and in particular Auscultatory Percussion maneuver, medium-to-intense pressure applied, for example, on a *healthy* heart **immediately** triggers the **information field** (a slight, hardly significant microcirculatory activation in the liver, spleen, heart, etc. simultaneously appears). It is interesting to notice that, when the 8-second Latency Time in the liver, spleen, stomach, etc. ends, this microcirculatory activation type I associated gets intense and significant: the organs and the bowels grow in volume, the inferior edges of liver and spleen lower and aspecific gastric reflex appears. Its duration is physiologically between 3 and 4 seconds [30].

On the contrary, in case of a severe coronary heart disease, this activation is simultaneous. Duration is pathologically longer, ranging from 7 to 8 seconds. In case of a slight or chronic disease, a *short* Latency Time is present, which varies from 1 to 3 seconds. Duration is pathological, between 4 and 6 seconds.

Under a condition of pathology or SQB Constitution or IRR of pathology, signal loses complexity from a biophysical viewpoint, and it becomes less chaotic when it reaches, for example, the stomach, and physician can perceive a reflex with pathological - or SQB Constitution or IRR of pathology - features. Particularly significant is the duration of aspecific gastric reflex, which can increase, be always equal to or more than 4 seconds. We can understand the extension of duration (which physiologically is always between 3 and 4 seconds, and never reaches 4 seconds) from a biochemical viewpoint (biophysics, quantum physics and biochemistry are parallel and consistent with one another).

Duration of the reflex increases because Microcirculatory Functional Reserve (MFR), histanic pH, Energy-Information endure critical alterations: reduction of ATP synthesis, increase of tissue acidosis, the resulting reduction of chaotic-deterministic features of local micro vessel oscillations will modify Biologic Information Field and, simultaneously, the intrinsic features of signal conveying the information throughout the body: the information content of signal is altered and reduced, entropy tends to zero, and consequently the alterations in stomach response, which mirror the information content (or structure) of the signal, have altered features compared to the physiological ones.

If MFR is physiological, blood will wash and take away protons and restore normal breath activity: pH will go up and Aspecific Gastric Reflex, a symptom for acidosis, will disappear because Energy-Information (EI) and biologic information field are restored to normal values!

David Bohm, in physics, introduces the concept of quantum potential which adds up to classical potential [31, 32]. Quantum potential is what contains the qualitatively important information (the radar which helps a ship find orientation and follow the desired route without hitting an iceberg), whilst the classical potential contains the rougher energy, the engines which keep the ship moving. Now, when Energy-Information goes down (a symptom for pathology or pathological tendency), Energy-Vibration and Energy-Matter simultaneously go up, thus causing acidosis increase [33].

When deterministic chaos is lost, qualitatively important information is consequently lost, and so is entropy. Under 'entropy' we have to understand the concept given by chaos theorists, not the one which was established by physicists studying thermodynamics [34].

All events in nature are shaped according to a particular form of energy transmission which is coded differently, meaning that total energy can neither be created nor destroyed [35]. Information is a type of virtual energy (Energy-Information or EI) with merely qualitative features, and EI is a part of the total transformation of energy-matter. Sum variation of all energy transformations, Energy-Vibration (EV) coded in Energy as Matter (EM) and Energy-Information (EI) must be always equal to zero.

- $(EM+EV+EI)=K$
- $\Delta(EM+EV+EI)=0$

In case of tissue acidosis, for example, we observe that EM goes up while EV and EI simultaneously and proportionally go down. Tissue acidosis is a symptom for potential pathology (pre-metabolic syndrome) or disease and it should be timely treated so as to reduce pH, for example, by improving tissue oxygenation and mitochondrial respiration.

It has been proved that, by increasing tissue oxygenation, EV will also increase, and so will EI, and simultaneously EM will decrease, thus reducing tissue acidosis.

The ATP produced by EM is Energy-Vibration (EV) which, after *critical* level has been overcome, makes Psychokinetic Diagnostics possible, by making EI available. When ATP and EI decrease below a critical level, just like in dying people, remote medical examination is no longer possible.

If deterministic chaos in the signal decreases, there's a simultaneous reduction in quantum potential according to Bohm (or in Energy-Information (EI) according to Manzelli), which nonetheless increases EM and EV. Therefore the signal will get with a larger quantity of these two energies, with a stronger quantity of rough energy, and therefore simultaneously less charged with Energy-Information (EI) (which only needs a little amount of Energy-Vibration (EV + EM) to travel to and fro). In regards of this I'll remind you of the principle of Eva Reich's minimal stimulus: if a slight energetic stimulus is produced (e.g., when trigger point for ureteral diagnosis is slightly stimulated), lower consistency domains will collect it and start swinging, and they will also make higher levels swing - on condition that this stimulus lasts sufficiently -, so chaotic energy turns into consistent energy, and the less chaotic signal will impact more on the stomach (periodic

or almost-periodic signal). Its duration is therefore longer due to increased EM + EV (see above). Vice versa, if more EI is restored (that is, EM+EV are lowered, by means of restructuring mitochondrial therapy, for example), the signal will get softer and milder (according to EV+EM) and also richer in information - this is a symptom for a restored physiological deterministic chaos, for a recovered structure qualitatively organized in fractals and therefore for recovery of a duration between 3 and 4 seconds.

Conclusions

Summing up, several viewpoints lead to our initial work hypothesis, according to which the structure of the signal triggering QBS aspecific gastric reflex is simultaneous and consistent with the structure of the attractor of corresponding microcirculatory oscillations that can be observed by triggering ureteral reflexes.

In particular, from QBS clinical and experimental evidences published in previous articles, also by authors who carried out correlate studies, we know that:

a) genome is fractal [36-38];

b) biological information fields pulsate, are fractal, have a complex structure (white area, in healthy people) which reduces (grey area, in QBS constitutions and IRRs of pathology, until reaching a black area, in pathology) when they are altered and Energy Information goes down [24];

the signal triggered by Auscultatory Percussion maneuver spreads in all directions throughout the body as an extension, an enlargement of biological information field which is characteristic of every cell, tissue, organ or viscera or of its parts (physician can hear the signal both on liver, spleen, stomach, heart, but the signal is always the same, with the same information content which starts from the stimulated trigger point);

c) there exists an explicit order, similar to the one theorized by David Bohm [31], e.g. space-time volumetric modifications of the stomach measured with S3Q parameters (latency, duration, intensity etc. of the reflex), that reveals an implicit order [39];

d) studies on quantum potential and explicit/implicit order made by authors such as David Bohm [31], Manzelli [35], Del Giudice, Tedeschi [27] and Vitiello [28, 29] corroborate our work hypothesis; signal is matter-energy-information with a specific complex structure, and this structure, which is fractal, is correlated with its information content, with Energy-Information, which in turn mirrors the presence or absence of deterministic chaos: entropy or information = 0 means absence of deterministic chaos, fixed point [34];

e) the explicit order (e.g. duration of aspecific gastric reflex) mirrors the signal's information content, that is its intrinsic structure, and simultaneously reflects the fractal

dimension of microcirculatory oscillations correlated to it (see MFR etc.). A duration above 4 seconds reflects a signal with less EI, with less deterministic chaos, and more EV-EM, so the stomach receives more Energy-Vibration (for this reason it moves more (in intensity) and longer (in duration) and simultaneously with less Energy-Information (with less complexity, less deterministic chaos).

Based on the observations outlined above, and in regards of the studies published on chaotic and quantum aspects of QBS [30-46], we can conclude that it is highly plausible that the intrinsic structure of QBS reflex, i.e. of the signal triggering the reflex, is parallel with the nature of the corresponding microcirculatory oscillations associated to it, so that, for example, the aspecific gastric reflex is a mirror of the information content of the signal and of oscillations / non-linear structures connected with it, and at the same time, as already known, a mirror of non-linear oscillations in vessel walls of local microcirculation.

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