Perspective

HAROLD BURR, SUBTLE ENERGIES AND THE INSUFFICIENCY THEOREM

by Garvin McCurdy, M.S.

ABSTRACT

Biology exhibits an organizing principle that inanimate matter does not. Harold Burr's demonstration of the organizing principle inherent in life enables a new, descriptive view of consciousness that transcends Burr's interest in the developing embryo and homeostatic biomaintenance, and reaches into aspects of conscious awareness and interactivity. Experience with subtle energy and evolving theories in energy medicine provide a vision of hitherto unrecognized biological componentry and function.

Developments in mathematical logic have revealed the limits inherent to logic, especially in self referent systems, such as human systems. Liberating implications from these limits to logic allow us to change our postulates, explicitly including the role of consciousness and superluminal communication, because the reach of current standard science is inadequate to the task.

KEYWORDS: Biofield, Bio-electric field, Consciousness, Mathematical logic, Paradigm, Quantum plenum, Insufficiency Theorem, Superluminal communication,

ISSSEEM recently asked me to write a companion piece to the article by Ronald Matthews on Harold Burr's work in the 1930s with biofields that appears elsewhere in this edition of Subtle Energies. I could not resist: I had not heard of Burr, but at least three synchronisms with my own theory building work fairly jumped off the pages:[1]

- Burr had coined the term 'organizing principle' and tied it to electromagnetics.
- Burr had to design a very sensitive vacuum tube voltmeter so that its measurements would not seriously affect the phenomenon being measured. With that technology it was a very neat trick indeed! He was right on the edge of the problem of quantum measurements!
- His investigations showed that:
  - Electromagnetics plays a very important organizing role in the development of the fertilized egg.
  - Electromagnetic anomalies appeared in living organisms prior to macroscopic detection of cancer.

This latter finding to this day is largely unexploited. It is worthy of significant effort with current technologies. MRI, for instance, gained its foothold largely because it does respond sensitively to malignancies. It yields a Burr effect obtained by other means, but it is scarcely predictive. Oncologists still rely on early stage macroscopic detection by palpation, hormonal change or X-ray for their best results.

So my own efforts could very well be a psychic extension of Burr's. But today we recognize we live in a 'tangled hierarchy' of consciousness. It is no longer possible to be as succinct and direct as Mr. Matthews has been. But let us try.

In 1987, ten years after I had left the military because what I was being told to do no longer made sense, my daughter gave me a small book, The Origins of Knowledge and Imagination, by Jacob Bronowski.[2] It was the text of his Silliman lectures given at Harvard in 1954. While I didn't learn much about the title's topic, I was fascinated by his account of Bertrand Russell's and Alfred North Whitehead's attempt, early in the 20th century, to enclose all mathematics in a small volume called ***Principia Mathematica*** as Newton had done for mechanics over two hundred years earlier.[3] Their basic assumption—their postulate—was that all math was made up of consistent logical systems (like Euclid's geometry) and they expected to derive a closed list of these in terms of axioms or postulates and rules of operation.[4] Then, in principle, all math would be condensed and captured. No such thing happened.

They started more or less from Euclid, the classic model, using the symbolic logic that had been recently developed by Peano.[5] They kept their criteria of consistency—their 'truth' table—independent of the system they were analyzing. That is, the truth table operated as kind of an 'impartial' mathematical judge. (Think of a trial judge or a committee assessing a figure skating competition.) If when they investigated a sequence of operations permitted by the

particular system, the truth table yielded 1 = 1, then that sequence of operations was consistent and could be classified as a 'theorem'. If the truth table yielded 1 ≠ 1, the operation was deemed inconsistent, and therefore deterministically useless.

Things went well until they started considering self-referent systems that included statements like the ancient Epimenides paradox, 'All Cretans are liars said Epimenides the Cretan.' And the truth table then yielded 1 ≠ 1. So they invented a new, 'higher order' class of systems to correct the problem. But exercising the new class soon yielded 1 ≠ 1. And this happened each time they invented a new, higher order class. They finally gave up when they began to consider 'if the class of all classes is a member of itself'.

It was not until 1932 when Kurt Gödel published his 'Insufficiency Theorem' that this confusion was mathematically clarified. Its existential implications are only currently being developed; it has been thought too abstract to have any practically descriptive function. Gödel invented a method whereby the truth table was no longer an independent judge, but was integrated right into the symbolic logical analysis.[6] He had made the system self-referent, much as humans themselves are. And in so doing he was able to discern two solutions:

Solution 1: There are not enough axioms or postulates to describe all of math as a single consistent logical system.

This limitation on consistent logical systems was a philosophical blow because we humans have a need, deep beyond mathematics, for consistency. Consistency is not, as Maslow thought, a developmental need; it is a much more basic 'security need'.[7] We realize now that each of us creates our own reality or world-outlook, and that personal outlook needs a degree of stability for us to function. Consistent logical systems of scientific thought, of economic process, of legal procedure, all are dynamic human systems that fall into the category that Russell and Whitehead and Gödel were concerned with. To be a bit more specific, the Catholic Church, the U.S. Army, General Motors, the United States Government, are all structured as consistent logical systems with their axioms and rules for action. They are also self-referent. Humans are the agency that transforms the abstract axioms and rules into a greater collective action and effect. The organizations are what quantum philosopher Amit Goswami would term 'entangled hierarchies'.[8] Their operations sometimes produce contradictions, unintended results often clearly seen as evident perversions of the formally stated purpose. Gödel's first solution tells us that this result is to be expected.

Thomas Kuhn's book, ***The Structure of Scientific Revolutions***, is detailed validation of the descriptive power of the first solution, and also of our human need for mental and emotional stability.[9] Kuhn described a scientific paradigm as having 1) a group of scientists investigating a particular topic, 2) a consistent logical system descriptive, perhaps also predictive, of the

phenomena being studied, and 3) a common method of measurement by which they can compare investigative results among the group. Standard science, per Kuhn, involves investigation of the implications of the logical system (corresponding to the theorems of Peano's symbolic logic). It leads in time to anomaly when the logical system no longer suffices to describe the observations. Some of the group, usually the younger ones, then embark on creative science, the use of imagination and intuition to modify the basic assumptions and/or rules of procedure to accommodate the new observations. Kuhn noted that members of the group with deep psychic investment in the old paradigm in terms of self image, or economic or social status very often deny the validity of the new ideas with all the resources at their disposal so that the new paradigm does not prevail until their passing.

Now from the basis of today's understanding of brain function, we can readily see that 'standard scientists' are operating from 'conditioned perception' that is shaped by their common consistent logical system and their common method of measurement. When we say 'conditioned perception' we infer operation of a complex set of self-reinforcing neural networks in the cerebral cortex that have developed the strong synaptic interconnections first described by Donald Hebb in the 1950s and'60s.[10] Their development was described by many neuroscientists and synopsized by Francis Crick in his 1994 book ***Astounding Hypothesis: The Scientific Search for the Soul.***[11] Neuroscientists have described the process in terms of the 'pruning' of many little-used neurons from the infant brain combined with Hebbian strengthening of others that are persistently exercised. This work was guided in a general fashion by that of Jean Piaget from the 1920s, which outlined the developmental stages of childhood. These two themes were subsequently tied together by educators into the current concept of successive 'windows of learning' that occur in childhood as the developing brain becomes able to support speech, reading, numbers, art, games, etc. at very high rates of learning.[12]

What has all this to do with Harold Burr and the intense effort he put into designing an extremely sensitive vacuum tube voltmeter with the intent of investigating the electric field of a salamander egg? ...Then finding that the egg's inherent polarization guided development of the embryo and fetus?? ...Then finding that anomalies in that biological electric field preceded the observable development of tumors in living animals?? Well, first, his techniques showed that electromagnetism had something to do with biological construction and the subsequent maintenance of the organism's biological integrity. Second, his techniques were later extrapolated, using transistor technology, to detect the action-potential and neural impulse in the large neuron of a certain kind of snail. The neural impulse, triggered when the voltage across a neuron's membrane reached a certain level called the 'action potential', was found to be a 'one way' pulse traveling along the axon to the

synapse where neurotransmitters were 'squirted' from vesicles across the tiny gap to receptors on the next neuron's dendrites. There, depending on the specific neurotransmitter, the transferred electric charge either aided or inhibited an action-potential threshold being reached in that neuron. And it was this mechanism that Donald Hebb studied to derive his concept of synaptic strengthening in the human cerebral cortex.

Burr saw something in the 1930s that Hebb did not quite see in the 1960s. It was that biology exhibits an 'organizing principle' that inanimate matter does not. But the science of the '30s and '60s, while developing better technological tools, lacked intellectual tools. It was a science still in the uncritical grip of THE SECOND LAW OF THERMODYNAMICS, i.e. a very strongly conditioned perception that energetic processes lead only to disorder. The principle is well grounded in First Industrial Revolution experience of explaining and predicting the operation of steam engines, autos and aircraft, and electric power production, distribution and consumption. But it fails when applied to life, because life clearly not only orders itself but organizes itself through sexual reproduction. In the case of humans we become living organisms composed of organs containing organelles that interact with each other to construct and maintain physiology and support sensation, emotion, and consciousness. Further, through consciousness, we can adapt to our environment or adapt our environment to us (for better or worse). Still further, we can join together into organizations that organize and multiply our efforts.

In about 2004, for the initial version of Life's Transductive Chain and quite unaware of Burr's thoughts about an 'organizing principle', I revised an equation by Willard Gibbs to express the operation of the Second Law for biology.[13] The original equation is:

$$\Delta G = \Delta H + T\Delta S$$

Where ΔG is the 'Gibbs free energy' change—energy available to do more work—over a process. ΔH is enthalpy change with components ΔE (internal energy change) and ΔPV, pressure-volume change, (change in the energy of compression); T is the system temperature, and ΔS is the change of entropy, the measure of the unavailability of system energy to do work because of disorder among its components. By its definition ΔS is either zero or negative.

Because of my personal experience with subtle energy, exposure to many manifestations of subtle energies through ISSSEEM, and reflection on life's self organization it seemed appropriately descriptive to modify Gibbs' equation like this for biology:

$$\Delta Gbio = \Delta H + \Delta ER + T(\Delta O - \Delta S)$$

Here the sign of S has been arbitrarily changed to positive so the equation assumes its original shape for inanimate processes. O is the organizing principle,

informational in nature, and with same dimensions as entropy, but superposed upon it. ΔER is energy arising from biological information input (from Tiller's R-domain) and most readily observed as 'healer's heat'. So the equation is written in classical terms, but posits a negentropic input mediated by the quantum plenum.[14]

Whoa! Without warning you, dear reader, I just threw in a couple of quantum terms and a reference to Tillers's seminal work, Conscious Acts of Creation.[15] Besides, the thermodynamic words and equations look awfully authoritative. But recognize that this is just a way to change the postulates to better accommodate what seem to be the facts surrounding consciousness, because the reach of current standard science is inadequate to the task. In the Kuhnian process, this standard science is 'necessary but not sufficient'.

In ***Conscious Acts of Creation*** and ***Some Science Adventures in Real Magic***, Tiller characterizes current science as involving interactions between matter and energy and diagrams it thusly:[16]

Matter <—> Energy

I had for some years thought of it as:

Matter <-> Energy <-> Space <-> Time

Which can be abbreviated as MEST (the arena we humans have MEST about in for millennia.) This construction brings in not only the quantum considerations that Tiller exploited, but relativistic considerations too. He views the new science as also involving information and consciousness. Including space and time, I would diagram it as:

MEST <-> Information <-> Consciousness

or MESTIC.

In MEST science there is an implicit postulate that consciousness is a negligible factor in our reality. In MESTIC science however, consciousness, working through information can be seen to be 'cybernetic', a term Norbert Wiener coined in the 1940s when he derived the basic math of the then infant science of robotics. From the Greek word for 'steersman', cybernetics involves automatic processes using weak but clear signaling that seek end goals by sensing progress toward them and making appropriate corrections until the goals are reached.[17] Sixty years later, perhaps the most highly developed of these systems are aircraft autopilots that can take a plane off, fly a pre-set course through mandatory turning points, altitude and speed changes, and land it at a destination airport thousands of miles away without human pilots touching the controls. Equally impressive are automatic assembly lines that perform many operations to transform a multitude of components into, say, an automobile body. ...Or into a computer chip. Of course, these systems mechanistically mimic the ways that humans performed the same operations starting with the Wright brothers and Henry Ford. And they still require conscious human oversight.

From here, operating in MESTIC science, it is only a small mental jump to apply a cybernetic outlook to the bioconstructive process. In essence that is what I did in my 2006 white paper A Formalistic Review of Plenal-Biological Transductions that assessed the paradigmatic progress of the way science has looked at physics from Newton through Maxwell, Einstein, the quantum theorists to Tiller and my 'transductive chain' approach.[18] I then used a MESTIC outlook to analyze two subprocesses in human embryonic development: the sex determination process and the process for manufacture and emplacement of the cortical neurons. From this and the predominant explanation of DNA to RNA transcription and subsequent RNA to protein translation, it seemed clear that we currently only grasp the 'just-in-time' manufacture of protein to fit appropriately into tissue assembly.[19] There must be a plethora of as yet unmeasured signals between the chromosomes to sequence and time the precise sites ('promoter sites') where DNA is opened and activated to produce tissue componentry, say, that effect whether the child is to be male or female or where neocortical 'gray cell' neurons migrate to and implant themselves.

The implication is that, in embryonic gestation in particular, there is access to a very complex 'developmental algorithm' based on a 'unique plan', perhaps encoded and superposed in the 'trash' DNA sequences produced by the conjunction of male and female gametes in the fertilized egg. Further, biological implementation of this plan requires precise cybernetic informational access to the past and the future to attain the final goal: a living, potential–laden, healthy newborn infant. So a seemingly disconnected body of work, by such diverse investigators as Nimtz, Penrose, Oschman, Shang and Popp, begins to merge, and in so doing produces an emerging vision of hitherto unrecognized biological componentry and function.[20]

That realization, coupled with Tiller's analysis of focused intention-driven changes in biological targets, led me to try to find alternate ways of looking at faster-that-light communication, because superluminal signals will enable a look into the future with respect to light speed communication. The result was my 2007 white paper Analysis of Time as the Enabler of Process that uses 'light cones' as tools to superpose superluminal communication on Einsteinian MEST (where communication of information is assumed to be limited by light speed).[21] By changing Einstein's postulate, we are able to reconfigure Tiller's 'inverted mirror' into an 'inverting light cone' that reaches into the past and into the future. It views, in particular, the neural system as functioning (in the aware state) to physiologically integrate many quantal informative inputs into sensation, emotion or perception, then into physical action. In this context quantum mechanics begins to make more sense. It is not just a tightly rule-bound, highly predictive theory about very tiny increments of MEST. It becomes a theory about the coalescence in the 'Now', i.e. the present instant, of possibilities inherent in the future. The coalescing elements are seen to be consciousness

Metalingual Dialog

"Daddy, who made us?

[Perfunctorily.] "God."

"Daddy, who made God?"

[A bit desperately.] "The Class of All Classes."

"Daddy, who made the Class of All Classes?

[Alert and desperate.] "The Class of Aaaaall Classes."

"Oh. ....I think I see."

[With great relief.] "Wheeeew! Would you like a story tonight?"

(particularly will, i.e. focused attention and intention) and information. And this infers, at least, that consciousness has been inherent and cybernetically informative in the universe since the Big Bang. At most, it infers that consciousness initiated the Bang!

So Harold Burr's insight that there is an organizing principle inherent in life has enabled a new, descriptive view of consciousness that transcends his interest in gestative bioconstruction and homeostatic biomaintenance and reaches into the aspects of conscious awareness and interactivity. Where do we go from here? Back to Gödel.

Solution 2: There are mathematical truths that cannot be described by any consistent logical system.

Surprisingly, this is the logical definition—the model, if you will—of a miracle. Where solution 1 tells us to be on the lookout for anomalies to our paradigms and to be prepared to re-examine our assumptions and methods, solution 2 tells us that not everything can be explained using consistent logical systems. Most anomalies can be accounted for through creative, sometimes drastic changes in the way we look at things. Some cannot. These are the miracles. Russell and Whitehead encountered one such as this, illustrated by this little poem of mine about a young child and father (the latter probably reading a newspaper).

Russell and Whitehead seem to have stumbled upon the ultimate question of 'Why should there be anything at all?' We live within the class of all classes and our science of consistent logical systems simply cannot answer the childish question that lies at the root of our spiritual and religious experience.

So look at the world anew and with amazement. All that we perceive—loved ones, life itself, earth, sky, stars, thought, emotion, etc. ad infinitum—is miracle. Don't forget to include yourself!

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CORRESPONDENCE: Garvin McCurdy • infohand@mac.com

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Conscious Acts of Creation; The Emergence of a New Physics, (Pavior Publishing, 2001). [In overview, this book describes in careful detail experiments that were done to affect reality by consciousness alone, without recourse to physical action.. It describes actions that are totally anomalous in a MEST context.:

- The ability of trained human consciousness to precisely effect intended actions in water and certain biological targets.
- The ability to effect such actions by inducing intention-bearing electromagnetic activity in 'simple' circuitry (called an Intention Imprinted Electronic Device, or IIED) that was electromagnetically shielded, thus clearly demonstrating an informational channel not explicable by our conventional understanding of electromagnetics.
- The transportability and persistence of the mentally treated circuitry to precisely effect the same changes as a surrogate for direct human intentional imprinting.]

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    - The ability of the physically displaced IIEDs to effect similar space-time changes at their new locations.
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thesis is commented upon by his distinguished coauthors, and he adds a final summary. It is concerned only with the aware state of consciousness, but is a significant early essay in MESTIC science.]

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