The Tom Bearden Website

Help support the research

Foundations of Electro-Magnetism
Slide Series

- Major Points of Presentation
- Chung's Carbon Filament Negative Resistor
- Aharanov-Bohm Effect
- Absorption and emission reactions (1)
- Absorption and emission reactions (2)
- Anti-engine for cell's deviation reverses cell back to normal
- Asymmetric regauging produces excess force, which can be used to do work on the system
- Asymmetric regauging produces excess force, which can be used to do work on the regauging system
- Becker's bone fracture healing experiments
- Becker's theoretical control system governing regeneration
- Becker's theoretical DC control system involved with response to injury
- Geometrical Distortion of Poynting Energy Flow
- Cosmic Bootstrap: Before the Big Bang
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- A Charged Particle is a Coupled System
- The Anomalies in Navy Electrolyte Experiments at China Lake
- Chung's Carbon Filament Negative Resistor

- Typical circuit has about 10^{-13} energy collection efficiency
- Classical View of EM
- Curved Spacetime acts as source or sink
- Chronic Disease Puzzling
- Cancer Characteristics
- Solving a Cancer Enigma
- Cancer: Characteristics
- Nonlinear Optics Distortion Correction Theorem
- The Electronuclear Reaction: Nuclear Reactions in TR-Zones (1)
- The Electronuclear Reaction: Nuclear Reactions in TR-Zones (2)
- The Electronuclear Reaction: Nuclear Reactions in TR-Zones (3)
- In Time-Reversed Zone: Nuclear reactions are biased
- In Time-Reversed Zone: Dynamics may be reversed
- Time-Reversed Zone: Significant only after time-density charging
- A New Conservation of Energy Law
- Questions on Carcinogens and EM

Radiation

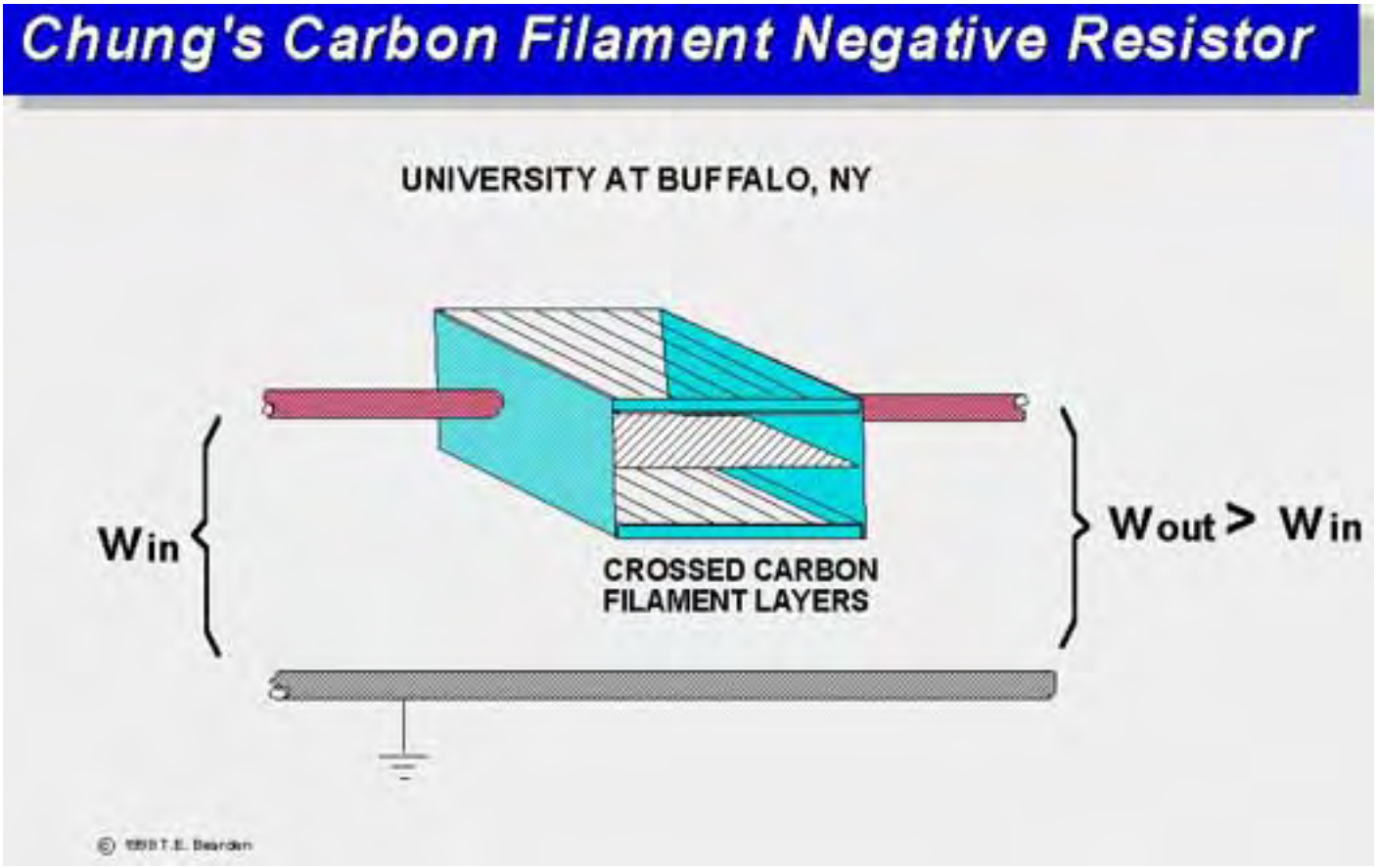
- AS DEFINED, fields and potentials only exist in and on charged matter
- Serious flaws and errors in classical EM theory
- Electrodynamicists' Reaction to Removal of the Material Ether
- Reaction to Loss of Material Ether (1)
- Reaction to Loss of Material Ether (2)
- Some EM waves in Spacetime
- Air Medium Disturbances Generated When Air is Perturbed by a Plucked Taut String
- Launching a Spacetime Perturbation ("EM Wave") from a Wire Antenna
- Phase Conjugate Wavepairs Produce New Waves
- Scalar Electromagnetics (Energetics) View of EM (1)
- Scalar Electromagnetics (Energetics) View of EM (2)

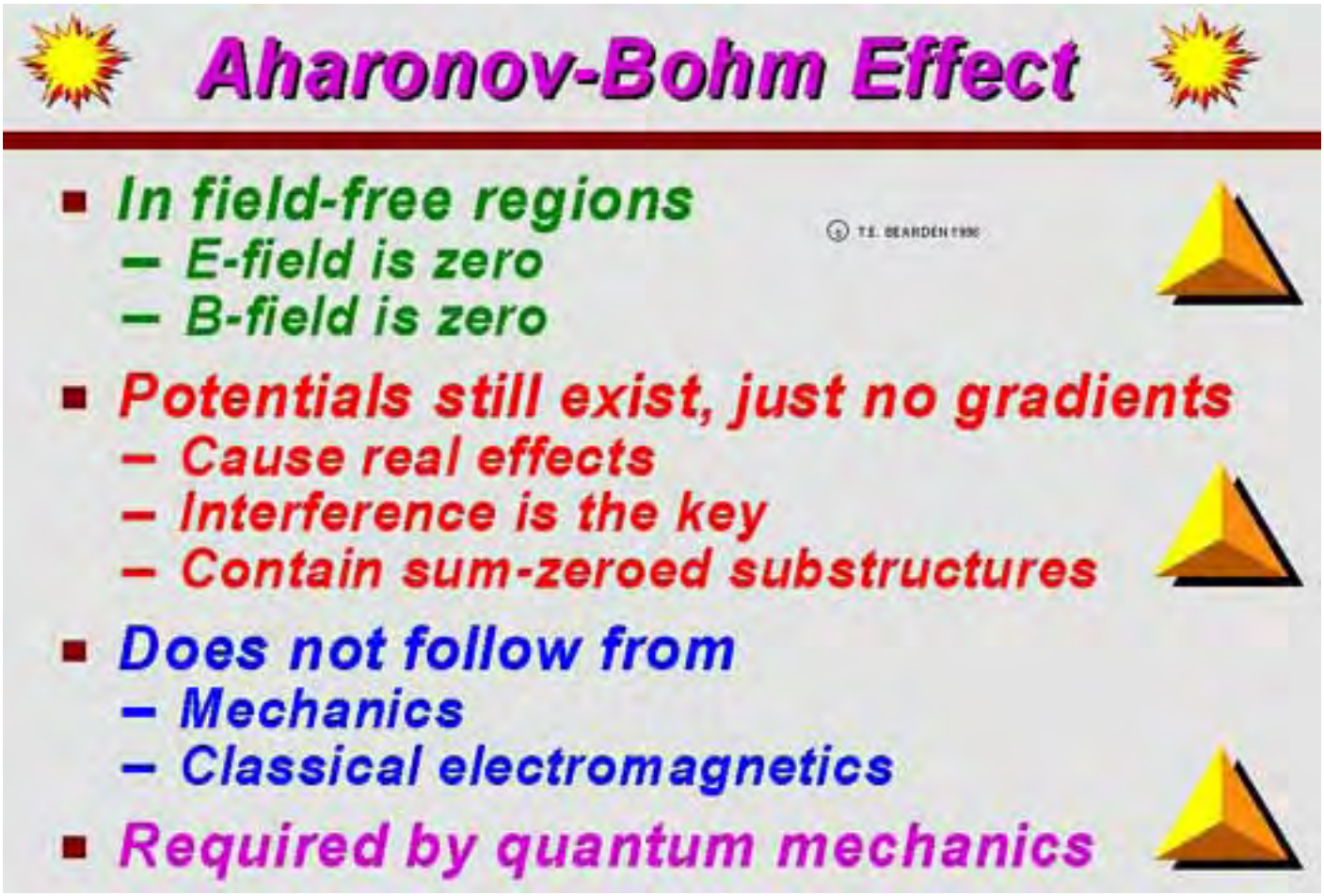
- Scalar Electromagnetics (Energetics) View of EM (3)
- Extended General Relativity Principle
- Extension of Work-Energy Theorem
- 34 Flaws in Classical EM Theory
- MTW's General Relativity Principle
- Use of General Relativity (GR) in Particle Physics
- The Missing Infolded Electrodynamics
- Infolded Engines: Excluded by Present Physics
- Mass curves and structures spacetime; ST curvatures change and structure mass (1)
- Mass curves and structures spacetime; ST curvatures change and structure mass (2)
- At Infinite Velocity: Each Is Every Other
- Lisitsyn's Report: Brain Code Broken
- Lorentz Closed Surface Integration
- Lorentz's physically insignificant energy flow can be collected and utilized
- Lorentz surface integration of the Poynting vector around a closed surface
- Longitudinal EM Photon Interaction with Charge
- Mass is transparent to longitudinal EM waves, which move through the infolded interiors of internal waves, potentials, and fields in the mass.

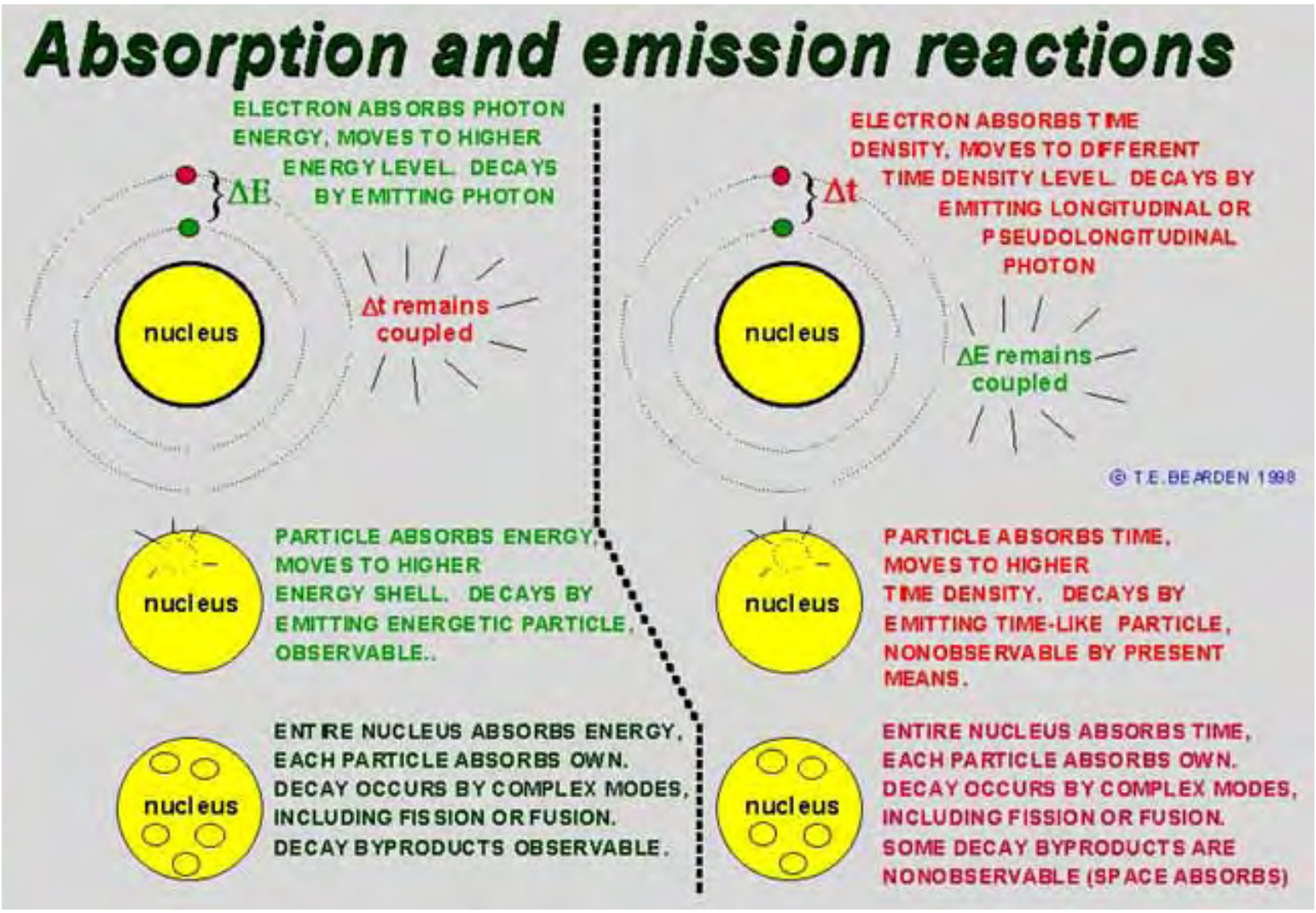
- Pumping with Longitudinal EM waves Time-reverses the Mass
- Maxwell's Quaternion Theory
- Maxwellian Systems before and after Regauging
- Maxwell's four equations reduce to: Page 1
- Maxwell's four equations reduce to: Page 2
- More to come

Major Points of Presentation

- Electrodynamic is seriously flawed
  - Some major flaws
  - Corrections indicated
- Why past corrective attempts failed
  - Force field concept is material
  - Missing two infolded transforms (M->ST; ST->M)
- Missing Infolded general relativity inside electrodynamics
- Several Kinds of EM Waves in Space
  - How to make
  - Transduction
- A French medical example as a deep experimental demonstration
  - Spectacular regenerative cures funded by French Govt
  - Not comprehended, therefore suppressed
- Cold Fusion examples of time-density wave effects
  - China Lake instrumental anomalies in electrolysis
  - Explanation of anomalous behavior of instruments
  - Explanation of new nuclear reactions
  - Wave energy transduction provides excess heat
- Urge theorists to consider dramatically new reactions


Chung's Carbon Filament Negative Resistor
UNIVERSITY AT BUFFALO, NY
Win
CROSSED CARBON
FILAMENT LAYERS
Wout > Win
© 1997 T.E. Bearden


Aharonov-Bohm Effect
In field-free regions
– E-field is zero
– B-field is zero
© T.E. BEARDEN 1990
Potentials still exist, just no gradients
– Cause real effects
– Interference is the key
– Contain sum-zeroed substructures
Does not follow from
– Mechanics
– Classical electromagnetics
Required by quantum mechanics


Absorption and emission reactions
ELECTRON ABSORBS PHOTON ENERGY, MOVES TO HIGHER ENERGY LEVEL. DECAYS BY EMITTING PHOTON
ΔE
nucleus
Δt remains coupled
ELECTRON ABSORBS TIME DENSITY, MOVES TO DIFFERENT TIME DENSITY LEVEL. DECAYS BY EMITTING LONGITUDINAL OR PSEUDOLONGITUDINAL PHOTON
Δt
nucleus
ΔE remains coupled
© T.E.BEARDEN 1998
nucleus
PARTICLE ABSORBS ENERGY, MOVES TO HIGHER ENERGY SHELL. DECAYS BY EMITTING ENERGETIC PARTICLE, OBSERVABLE..
nucleus
PARTICLE ABSORBS TIME, MOVES TO HIGHER TIME DENSITY. DECAYS BY EMITTING TIME-LIKE PARTICLE, NONOBSERVABLE BY PRESENT MEANS.
nucleus
ENTIRE NUCLEUS ABSORBS ENERGY, EACH PARTICLE ABSORBS OWN. DECAY OCCURS BY COMPLEX MODES, INCLUDING FISSION OR FUSION. DECAY BYPRODUCTS OBSERVABLE.
nucleus
ENTIRE NUCLEUS ABSORBS TIME, EACH PARTICLE ABSORBS OWN. DECAY OCCURS BY COMPLEX MODES, INCLUDING FISSION OR FUSION. SOME DECAY BYPRODUCTS ARE NONOBSERVABLE (SPACE ABSORBS)

Absorption and emission reactions

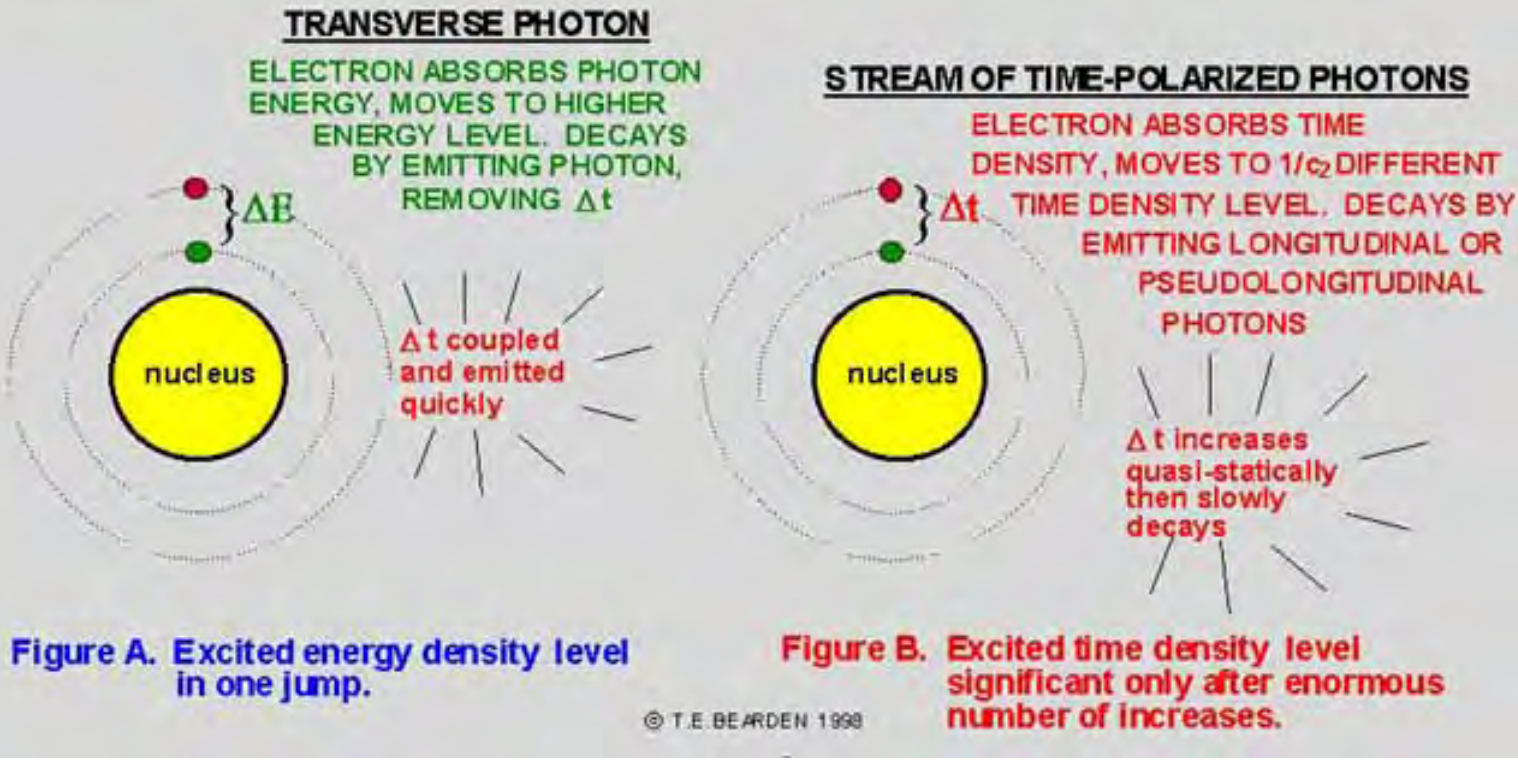
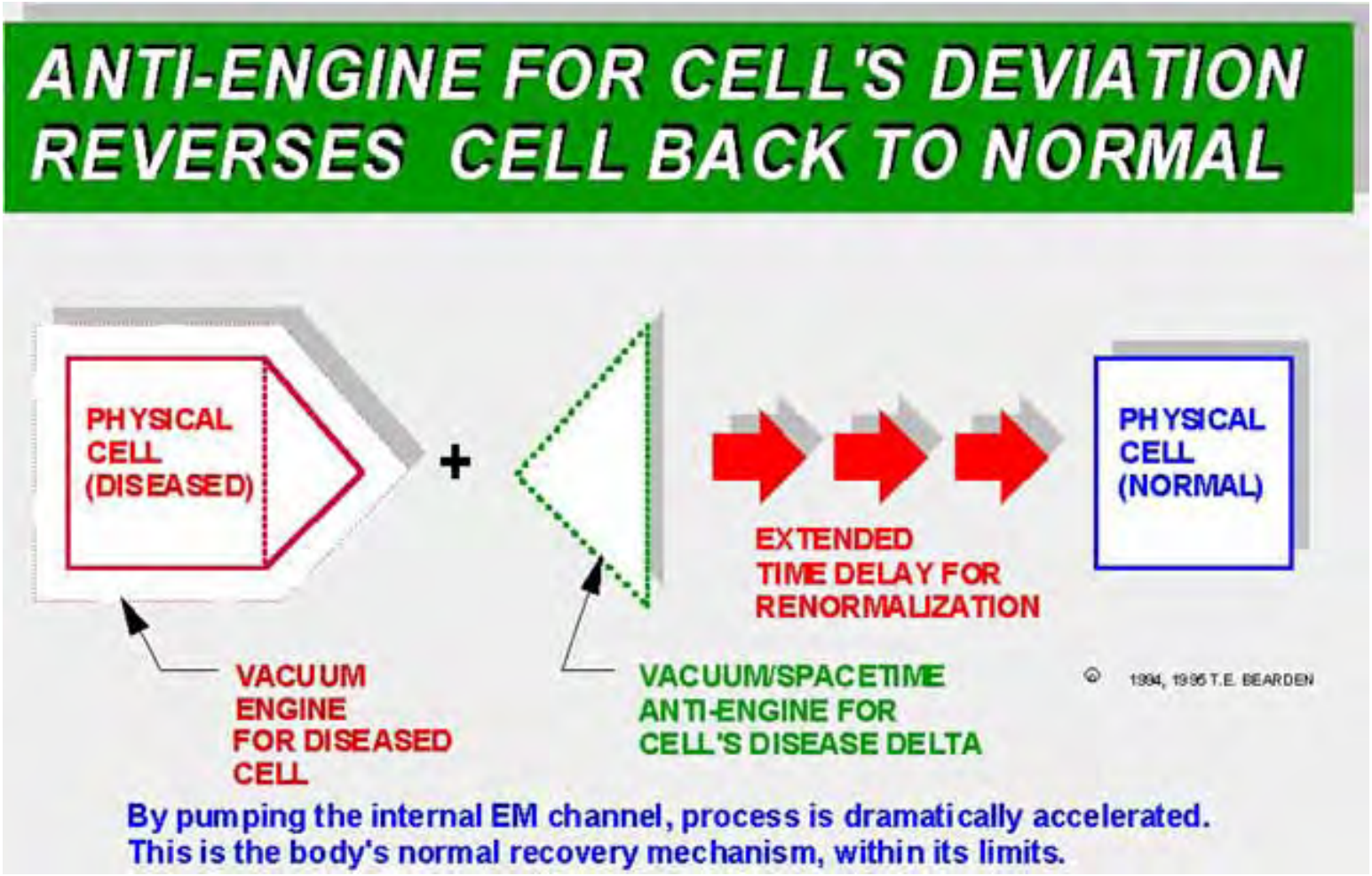


Figure A. Excited energy density level in one jump.

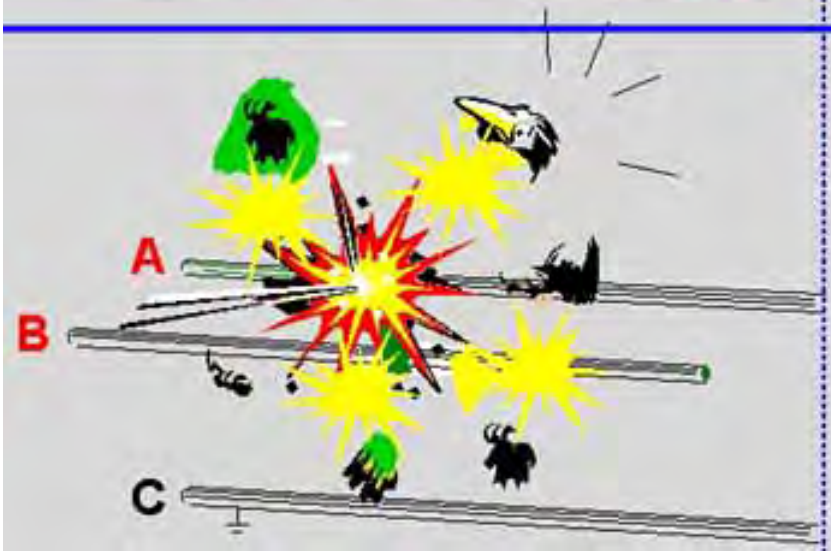
Figure B. Excited time density level significant only after enormous number of increases.


ANTI-ENGINE FOR CELL'S DEVIATION REVERSES CELL BACK TO NORMAL
PHYSICAL CELL (DISEASED)
+
EXTENDED TIME DELAY FOR RENORMALIZATION
PHYSICAL CELL (NORMAL)
VACUUM ENGINE FOR DISEASED CELL
VACUUM/SPACETIME ANTI-ENGINE FOR CELL'S DISEASE DELTA
© 1994, 1995 T.E. BEARDEN
By pumping the internal EM channel, process is dramatically accelerated.
This is the body's normal recovery mechanism, within its limits.

Asymmetric Regauging Produces Excess Force, Which Can be Used to Do Work on the System

Net Symmetric Regauging Does No Excess Work on the System

This little bird put one foot on wire A, and then the second foot on wire A also. He *net symmetrically* regauged, so he had no net excess force across him, even though his potential energy was increased. He asymmetrically regauged each foot, but both simultaneously so that one countered the other. Wise little bird!

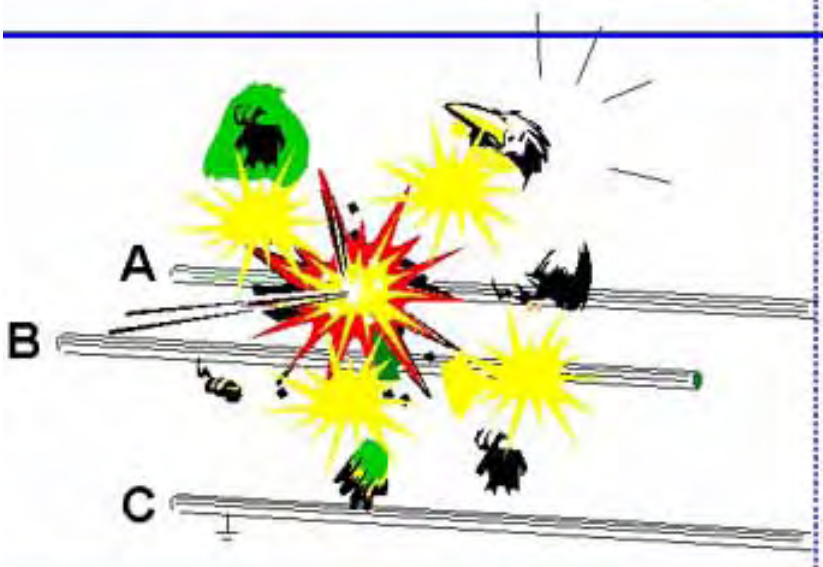


Net Asymmetric Regauging Can Do Excess Work on the System

This little bird put one foot on wire A, and then the second foot on wire B. He *net asymmetrically* regauged, so he had lots of net excess force across him. That force then violently translated his little body parts every which way, doing lots of work in and on him. Bummer!

Net Symmetric Regauging Does No Excess Work on the System

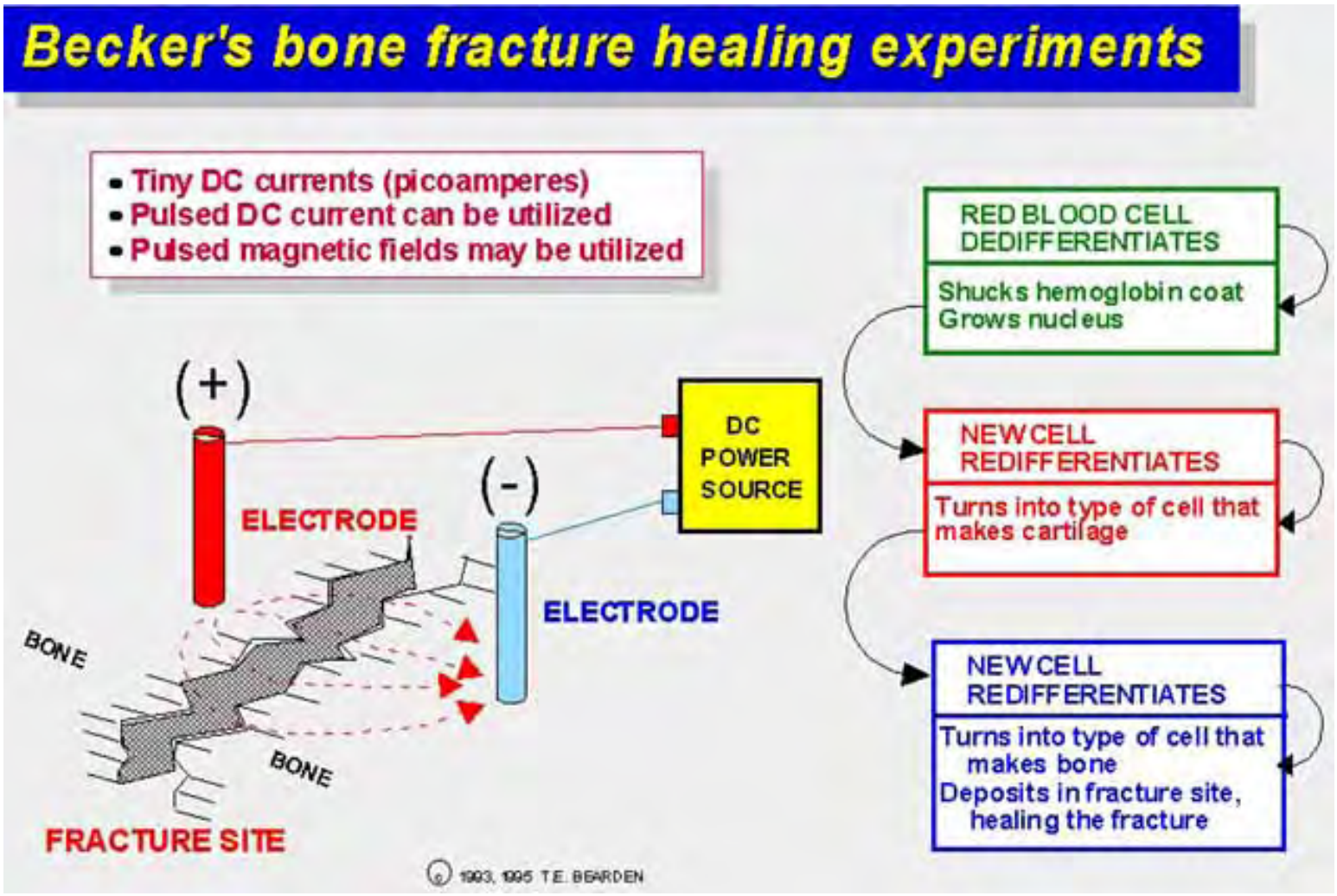
This little bird put one foot on wire A, and then the second foot on wire A also. He *net symmetrically* regauged, so he had no net excess force across him, even though his potential energy was increased. He asymmetrically regauged each foot, but both simultaneously so that one countered the other. Wise little bird!



Net Asymmetric Regauging Can Do Excess Work on the System

This little bird put one foot on wire A, and then the second foot on wire B. He *net asymmetrically* regauged, so he had lots of net excess force across him. That force then violently translated his little body parts every which way, doing lots of work in and on him. Bummer!

Figure 32. Asymmetric regauging produces excess force, which can be used to do work on the regauging system.


Becker's bone fracture healing experiments
• Tiny DC currents (picoamperes)
• Pulsed DC current can be utilized
• Pulsed magnetic fields may be utilized
(+)
(-)
DC POWER SOURCE
ELECTRODE
ELECTRODE
BONE
BONE
FRACTURE SITE
RED BLOOD CELL DEDIFFERENTIATES
Shucks hemoglobin coat
Grows nucleus
NEW CELL REDIFFERENTIATES
Turns into type of cell that makes cartilage
NEW CELL REDIFFERENTIATES
Turns into type of cell that makes bone
Deposits in fracture site, healing the fracture
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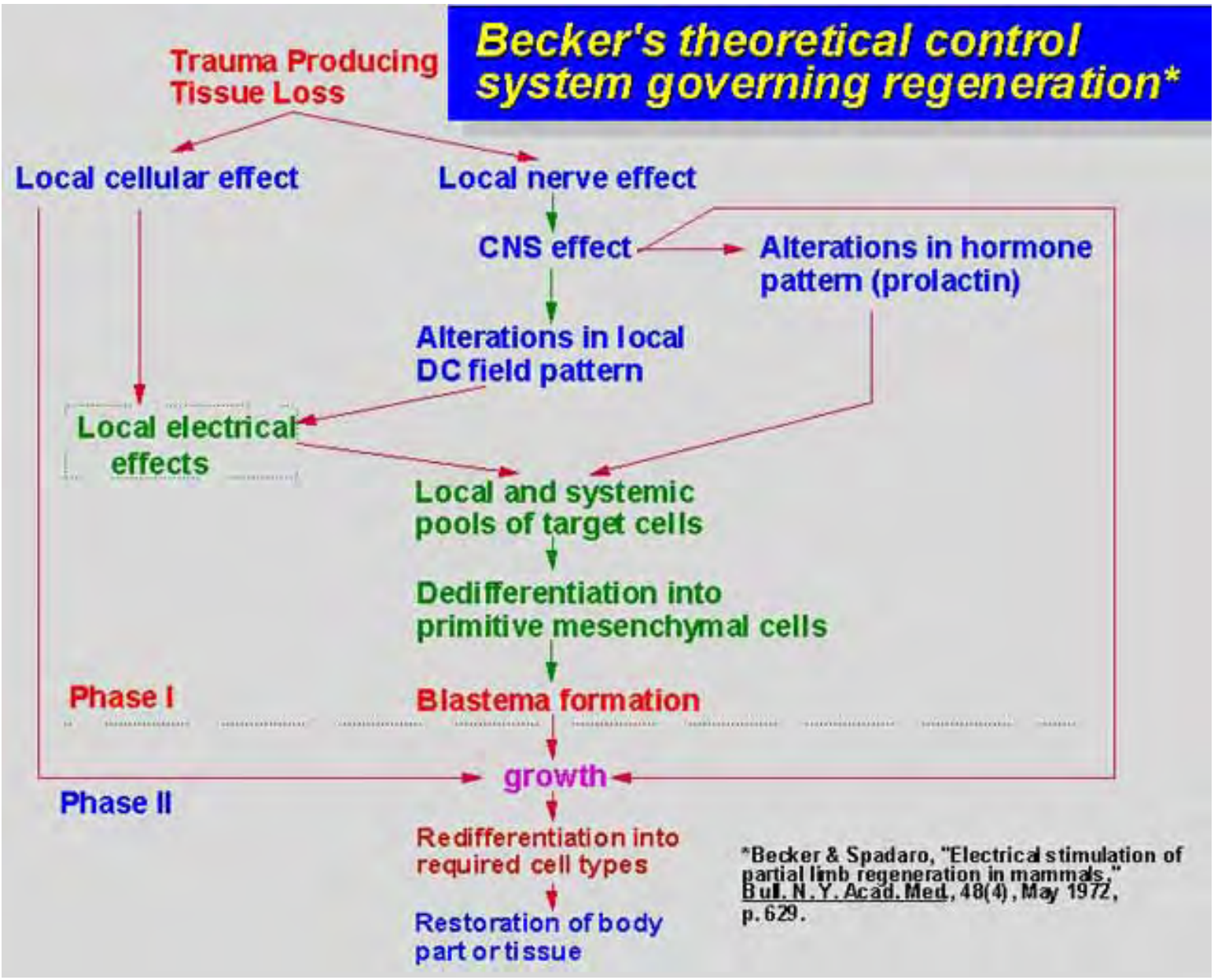
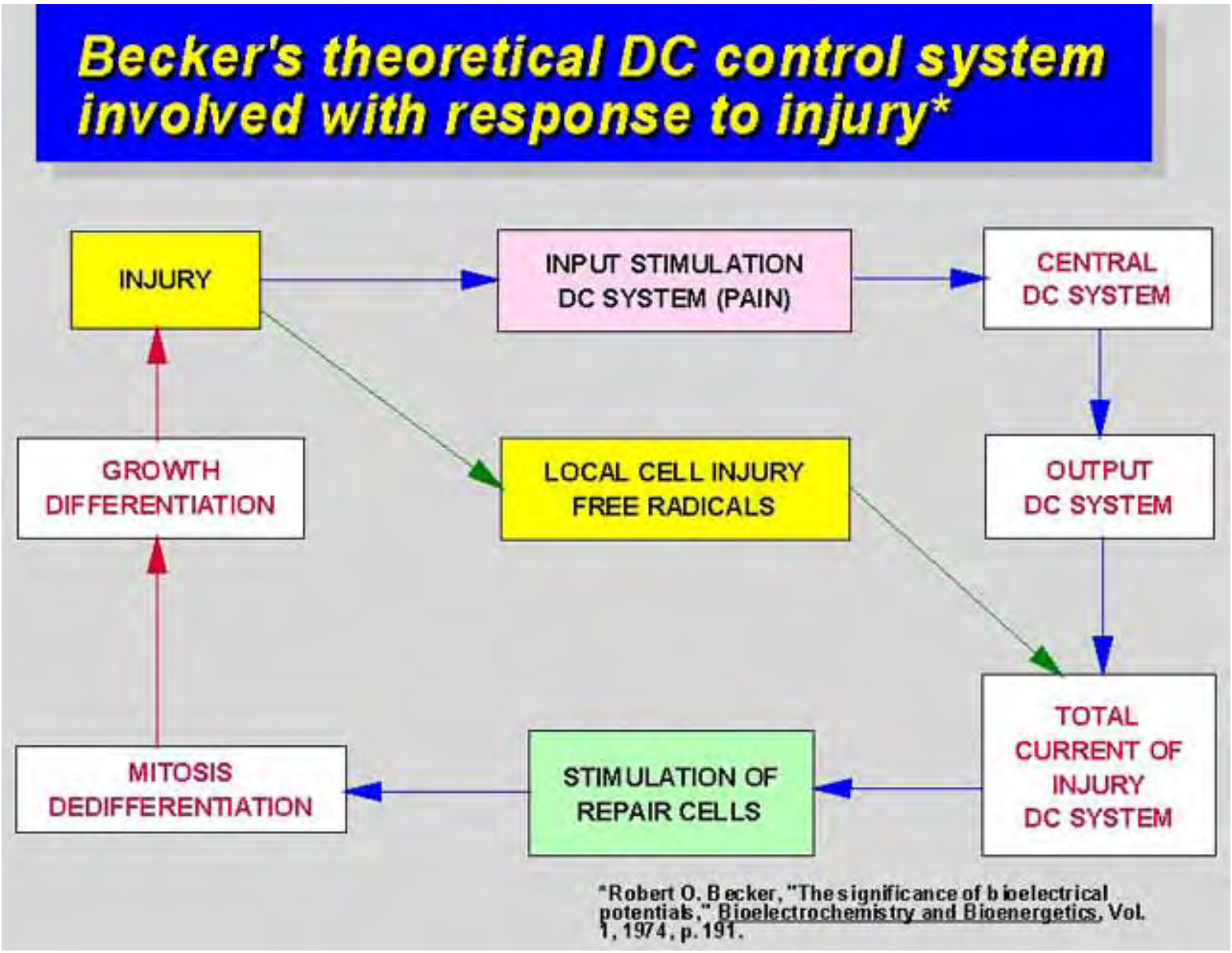
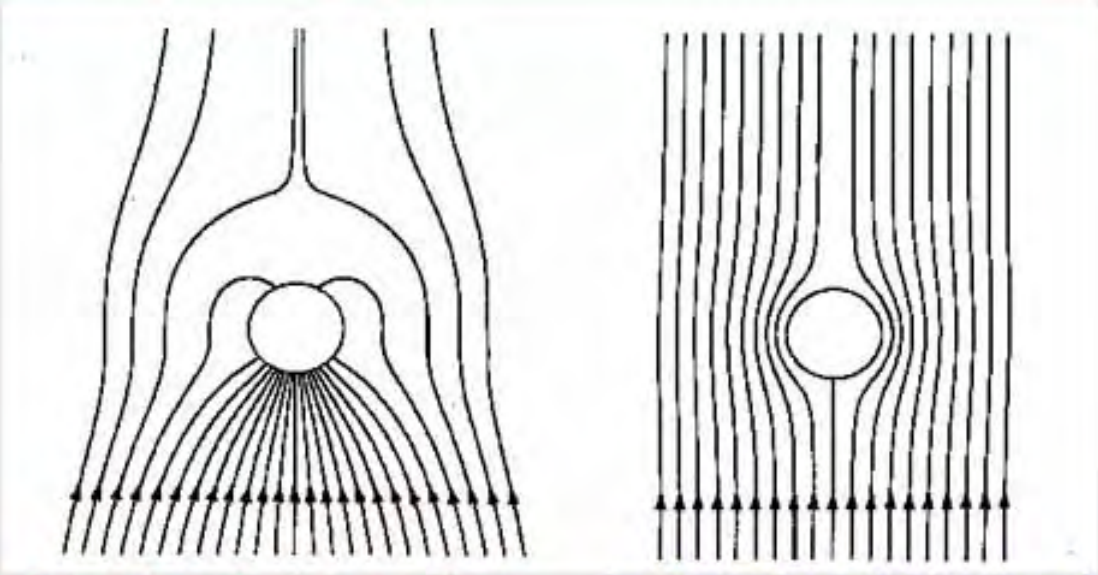

Becker's theoretical control system governing regeneration*
Trauma Producing Tissue Loss
Local cellular effect
Local nerve effect
CNS effect
Alterations in hormone pattern (prolactin)
Alterations in local DC field pattern
Local electrical effects
Local and systemic pools of target cells
Dedifferentiation into primitive mesenchymal cells
Phase I
Blastema formation
growth
Phase II
Redifferentiation into required cell types
Restoration of body part or tissue
*Becker & Spadaro, "Electrical stimulation of partial limb regeneration in mammals," Bull. N.Y. Acad. Med., 48(4), May 1972, p. 629.


Becker's theoretical DC control system involved with response to injury*
INJURY
INPUT STIMULATION DC SYSTEM (PAIN)
CENTRAL DC SYSTEM
GROWTH DIFFERENTIATION
LOCAL CELL INJURY FREE RADICALS
OUTPUT DC SYSTEM
TOTAL CURRENT OF INJURY DC SYSTEM
MITOSIS DEDIFFERENTIATION
STIMULATION OF REPAIR CELLS
*Robert O. Becker, "The significance of bioelectrical potentials," Bioelectrochemistry and Bioenergetics, Vol. 1, 1974, p. 191.

Geometrical Distortion of Poynting Energy Flow

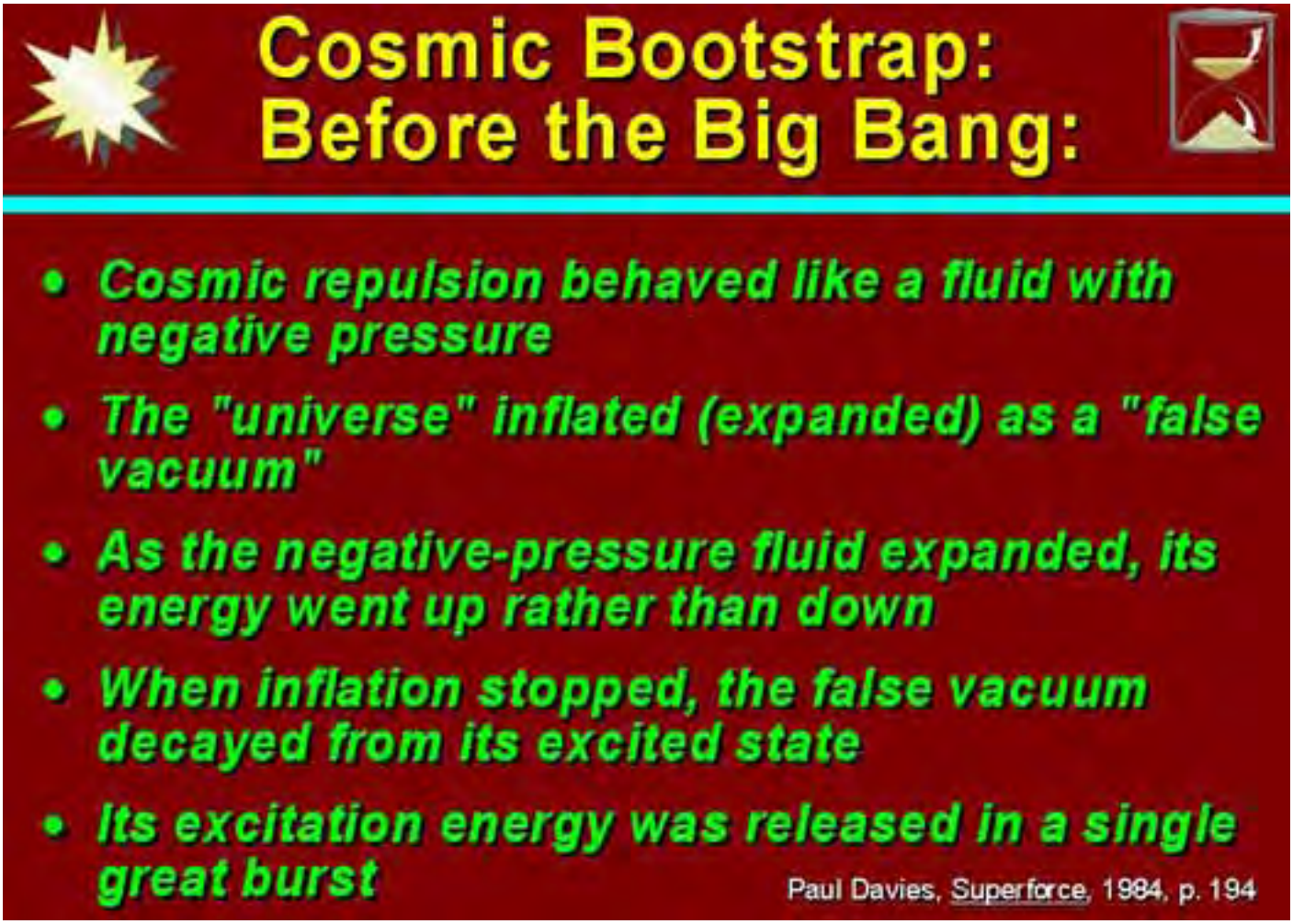
At or near resonance frequency, in the case shown the energy collection fraction (reaction cross section) increases dramatically.

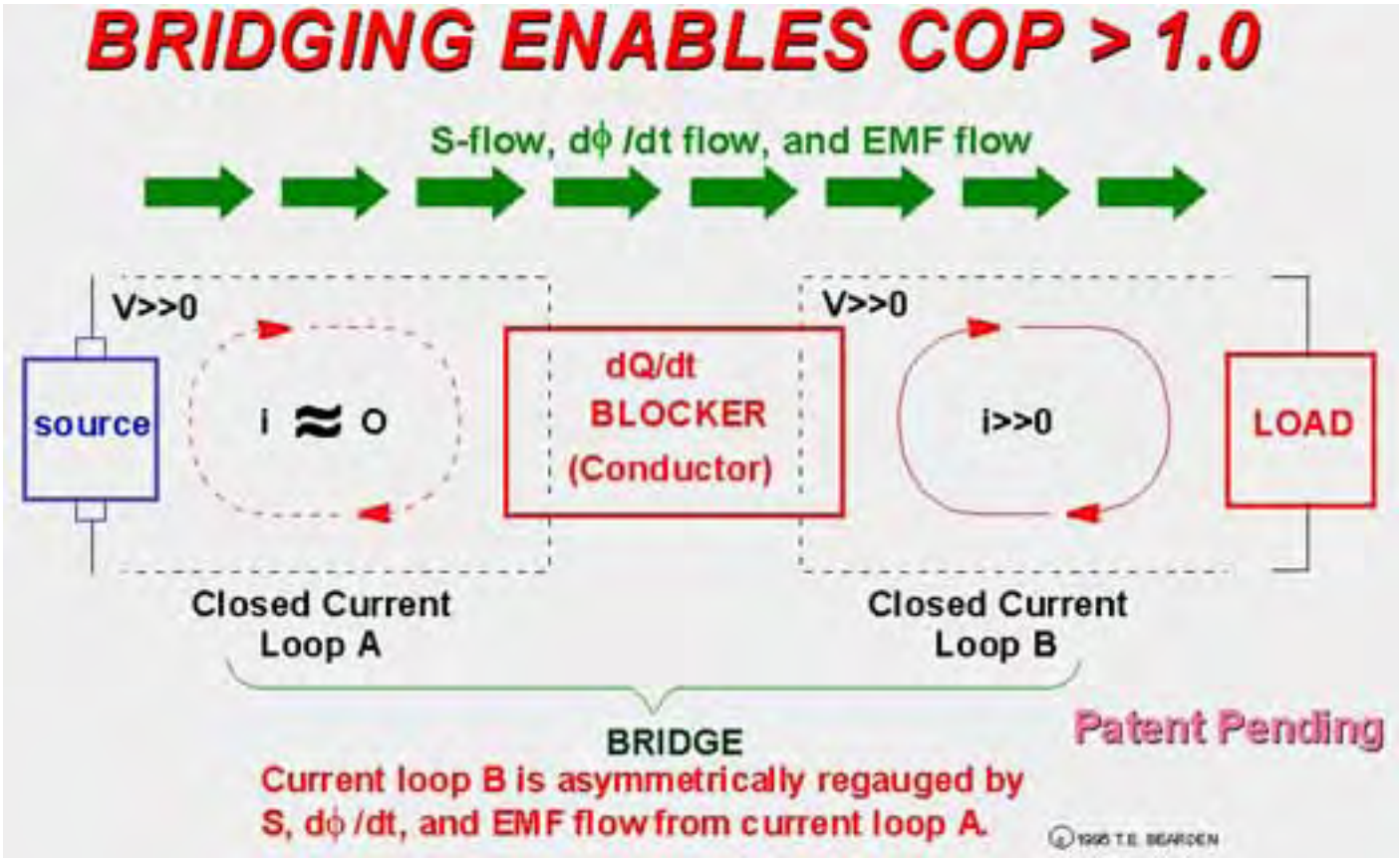


a. Around an aluminum sphere at light energy 8.8 eV. Absorption efficiency = 18.00.

b. Around an aluminum sphere at light energy 5eV. Absorption efficiency = 0.1.

Figures per Craig F. Bohren, "How can a particle absorb more than the light incident upon it? ", American Journal of Physics, 51(4), Apr. 1983, p. 326.


Cosmic Bootstrap:
Before the Big Bang:
• Cosmic repulsion behaved like a fluid with negative pressure
• The "universe" inflated (expanded) as a "false vacuum"
• As the negative-pressure fluid expanded, its energy went up rather than down
• When inflation stopped, the false vacuum decayed from its excited state
• Its excitation energy was released in a single great burst
Paul Davies, Superforce, 1984, p. 194


BRIDGING ENABLES COP > 1.0
S-flow, dϕ /dt flow, and EMF flow
V>>0
source
I ≈ O
dQ/dt
BLOCKER
(Conductor)
V>>0
i>>0
LOAD
Closed Current
Loop A
Closed Current
Loop B
BRIDGE
Patent Pending
Current loop B is asymmetrically regauged by
S, dϕ /dt, and EMF flow from current loop A.
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Aspects of Strong Local Asymmetry

- If local asymmetry is strong, conservation laws may be appreciably violated
  - Energy
  - Charge
  - Spin
  - Momentum
  - Angular momentum

- Properties of an object may differ appreciably for
  - Different observers
  - Different detecting means
  - One time to another
  - One position to another

- STRUCTURING THE INFOLDED EM INSIDE POTENTIALS, FIELDS, AND WAVES
  - Strongly breaks local symmetry
  - Provides spacetime engines giving the above effects

Other Aspects of Strong Local Asymmetry

- Local spacetime is curved
- Lorentz invariance of vacuum is violated
- May be a local "sink" or "source"
- Gravitational-inertial effects from EM
- Translation between virtual and observable
- Electrogravitational solitons
- Action at a distance
- Transmutation effects may exist
- Scalar/pseudoscalar field translation
- COMMENT: Thus the use of infolded longitudinal EM fields and waves to strongly break local symmetry allows interested clustering of spacetime curvatures. These spacetime structures are *vacuum engines*, or *spacetime engines*.

Bunge on the Status of Electrodynamics

"... it is not usually acknowledged that electrodynamics, both classical and quantal, are in a sad state..."

"... the best modern physicist is the one who acknowledges that neither classical nor quantum physics are cut and dried, both being full of holes and in need of a vigorous overhauling..."

*Mario Bunge, Foundations of Physics, Springer-Verlag, New York, NY, 1967, p. 176.

Bunge on the Status of Electrodynamics and Physics

"... it is not usually acknowledged that electrodynamics, both classical and quantal, are in a sad state...

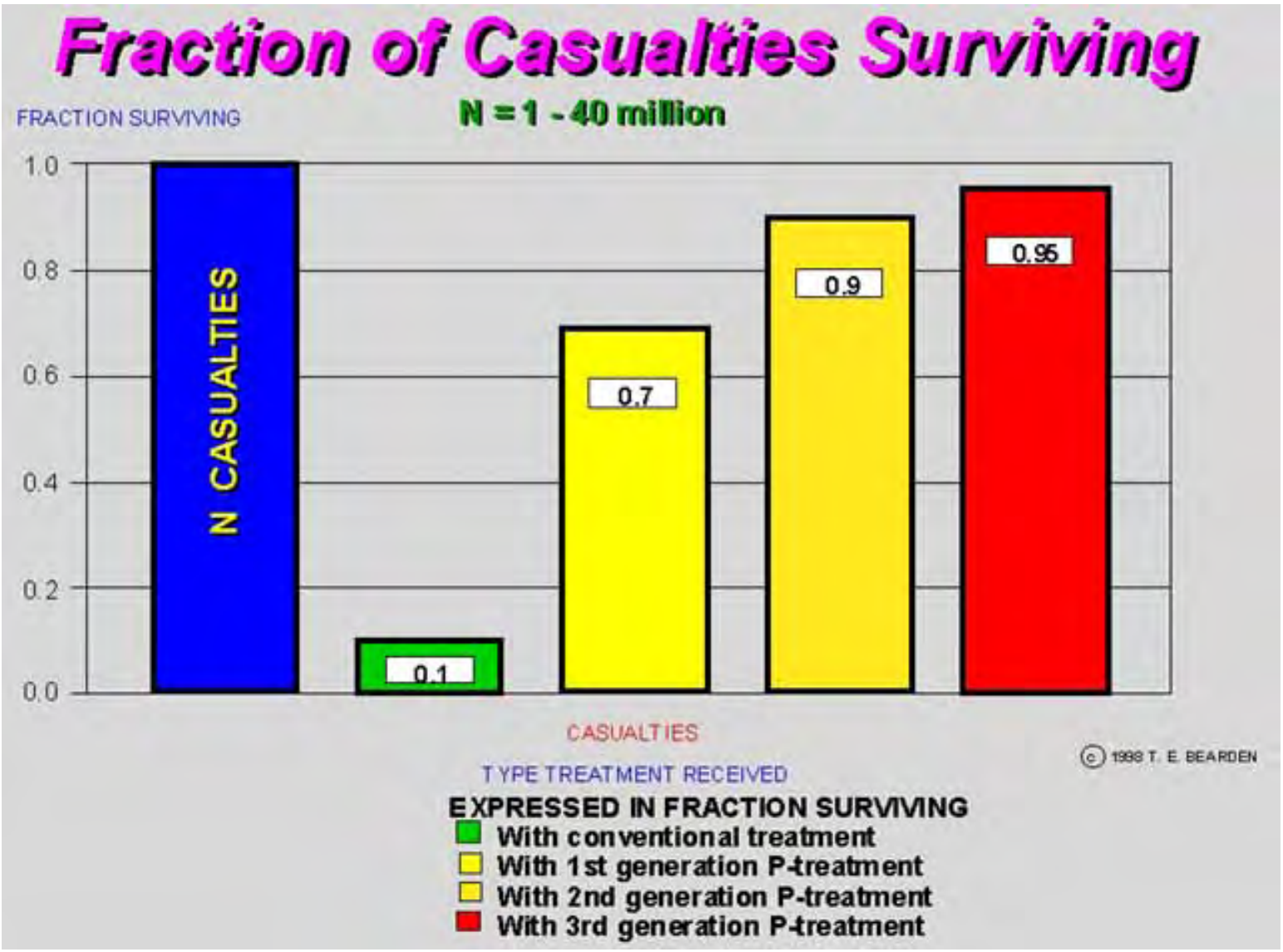
"... neither classical nor quantum physics are cut and dried, both being full of holes and in need of a vigorous overhauling..."

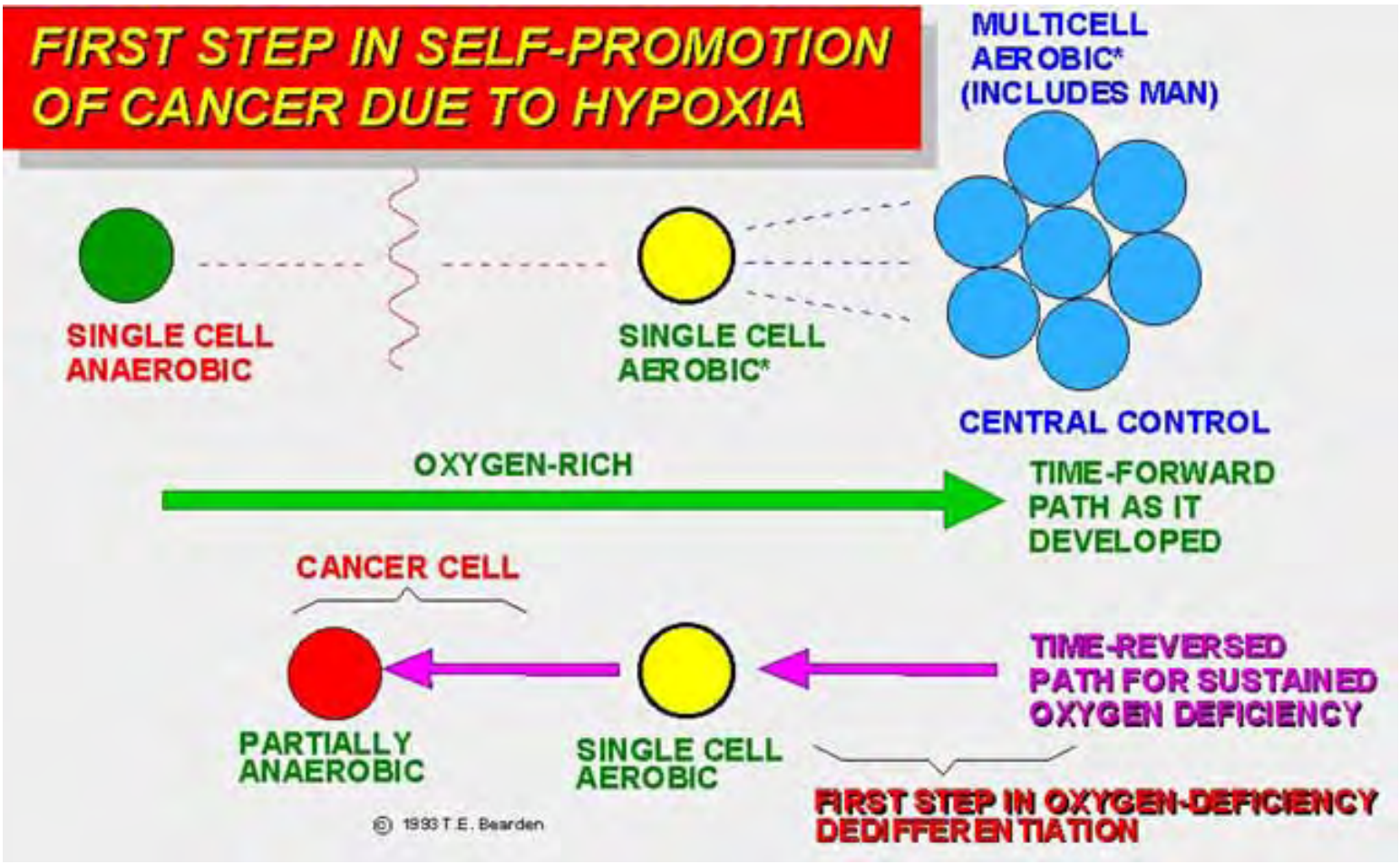
*Mario Bunge, Foundations of Physics, Springer-Verlag, New York, NY, 1967, p. 176..

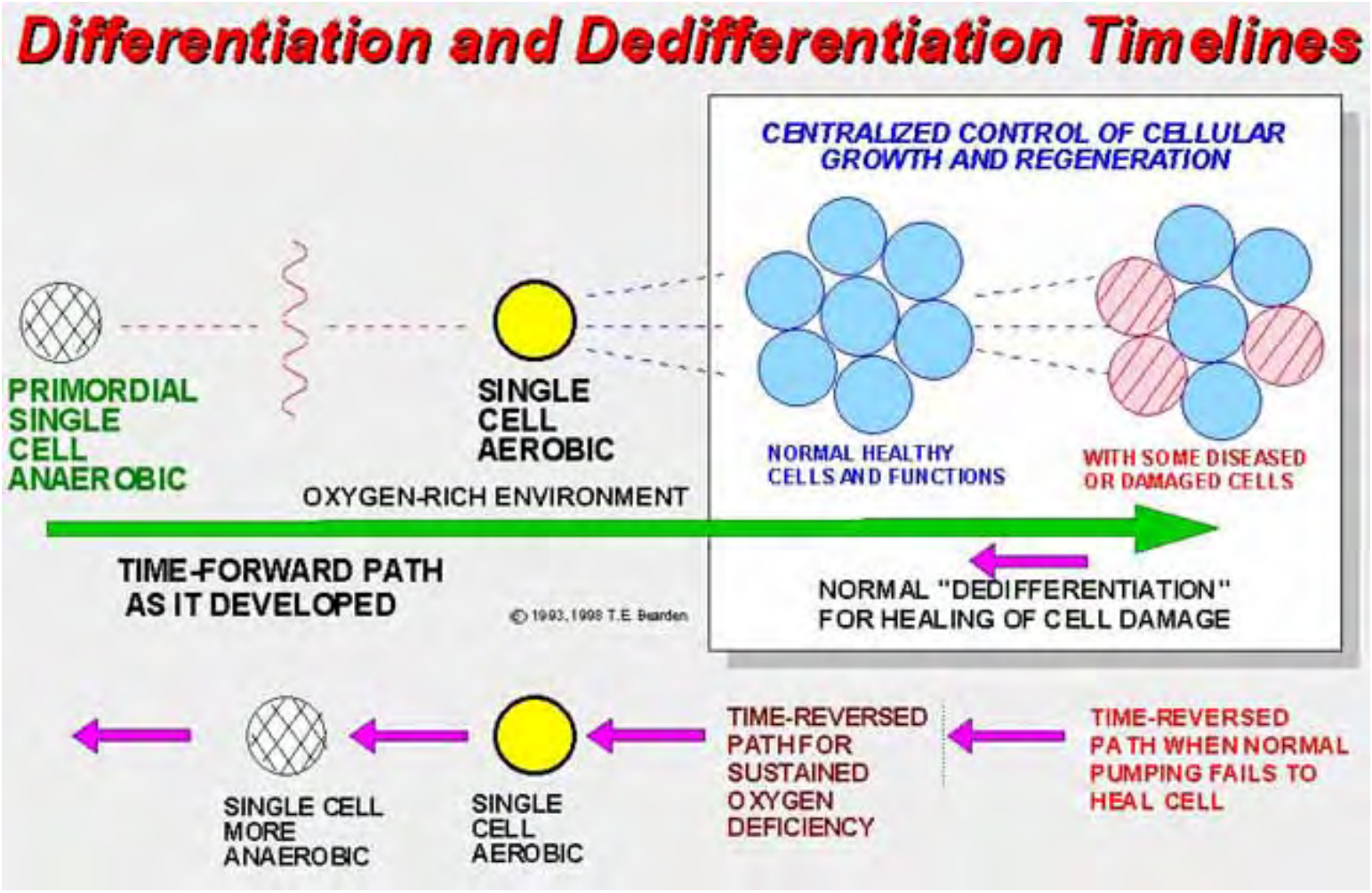
Bunge on the Status of Classical and Quantum Physics

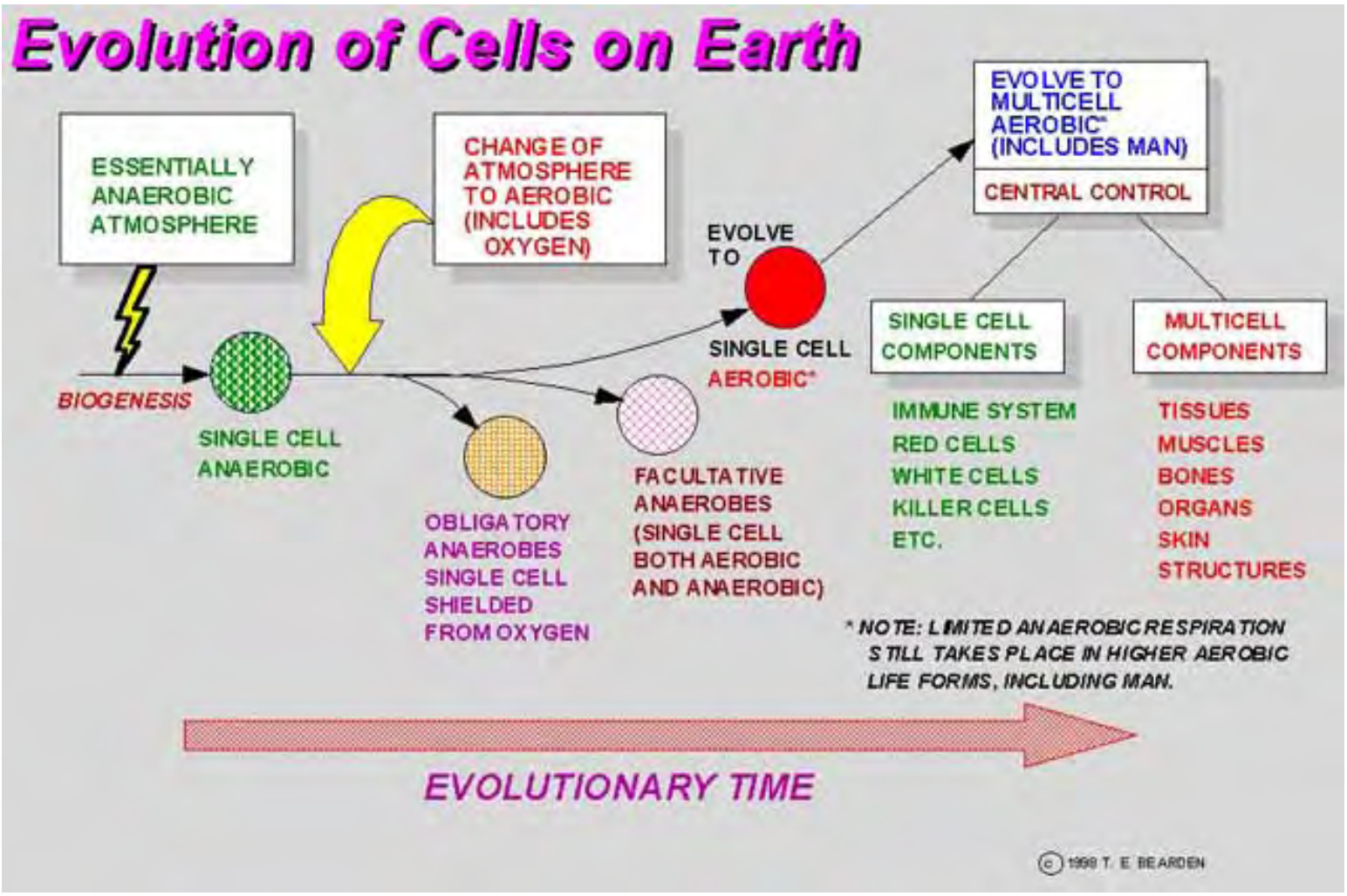
"... it is not usually acknowledged that electrodynamics, both classical and quantal, are in a sad state... the best modern physicist is the one who acknowledges that neither classical nor quantum physics are cut and dried, both being full of holes and in need of a vigorous overhauling not only to better cover their own domains but also to join smoothly so as to produce a coherent picture of the various levels of physical reality."

*Mario Bunge, Foundations of Physics, Springer-Verlag, New York, NY, 1967, p. 176..


Fraction of Casualties Surviving
N = 1 - 40 million
FRACTION SURVIVING
1.0
0.8
0.6
0.4
0.2
0.0
N CASUALTIES
0.1
0.7
0.9
0.95
CASUALTIES
TYPE TREATMENT RECEIVED
© 1998 T. E. BEARDEN
EXPRESSED IN FRACTION SURVIVING
With conventional treatment
With 1st generation P-treatment
With 2nd generation P-treatment
With 3rd generation P-treatment


FIRST STEP IN SELF-PROMOTION OF CANCER DUE TO HYPOXIA
MULTICELL AEROBIC* (INCLUDES MAN)
SINGLE CELL ANAEROBIC
SINGLE CELL AEROBIC*
CENTRAL CONTROL
OXYGEN-RICH
TIME-FORWARD PATH AS IT DEVELOPED
CANCER CELL
TIME-REVERSED PATH FOR SUSTAINED OXYGEN DEFICIENCY
PARTIALLY ANAEROBIC
SINGLE CELL AEROBIC
FIRST STEP IN OXYGEN-DEFICIENCY DEDIFFERENTIATION
© 1993 T.E. Bearden


Differentiation and Dedifferentiation Timelines
CENTRALIZED CONTROL OF CELLULAR GROWTH AND REGENERATION
PRIMORDIAL SINGLE CELL ANAEROBIC
SINGLE CELL AEROBIC
OXYGEN-RICH ENVIRONMENT
NORMAL HEALTHY CELLS AND FUNCTIONS
WITH SOME DISEASED OR DAMAGED CELLS
TIME-FORWARD PATH AS IT DEVELOPED
© 1993, 1998 T.E. Bearden
NORMAL "DEDIFFERENTIATION" FOR HEALING OF CELL DAMAGE
SINGLE CELL MORE ANAEROBIC
SINGLE CELL AEROBIC
TIME-REVERSED PATH FOR SUSTAINED OXYGEN DEFICIENCY
TIME-REVERSED PATH WHEN NORMAL PUMPING FAILS TO HEAL CELL


Evolution of Cells on Earth
ESSENTIALLY ANAEROBIC ATMOSPHERE
CHANGE OF ATMOSPHERE TO AEROBIC (INCLUDES OXYGEN)
EVOLVE TO MULTICELL AEROBIC* (INCLUDES MAN)
CENTRAL CONTROL
EVOLVE TO
SINGLE CELL AEROBIC*
SINGLE CELL COMPONENTS
MULTICELL COMPONENTS
BIOGENESIS
SINGLE CELL ANAEROBIC
OBLIGATORY ANAEROBES SINGLE CELL SHIELDED FROM OXYGEN
FACULTATIVE ANAEROBES (SINGLE CELL BOTH AEROBIC AND ANAEROBIC)
IMMUNE SYSTEM
RED CELLS
WHITE CELLS
KILLER CELLS
ETC.
TISSUES
MUSCLES
BONES
ORGANS
SKIN
STRUCTURES
* NOTE: LIMITED ANAEROBIC RESPIRATION STILL TAKES PLACE IN HIGHER AEROBIC LIFE FORMS, INCLUDING MAN.
EVOLUTIONARY TIME
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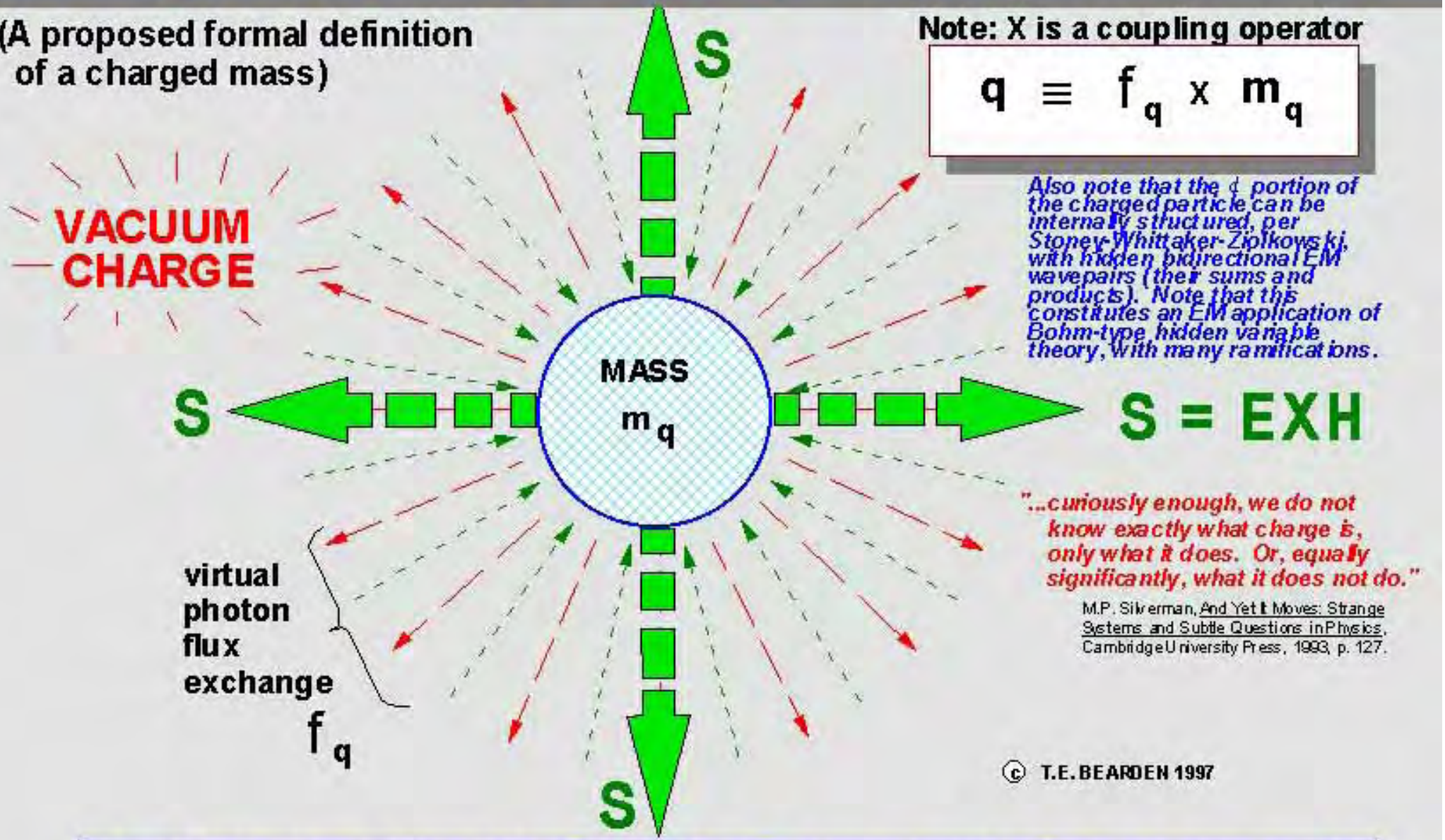
A Charged Particle q Is a Coupled System of m and ϕ

(A proposed formal definition of a charged mass)

Note: X is a coupling operator

$$q \equiv f_q \times m_q$$



Also note that the ϕ portion of the charged particle can be internally structured, per Stoney-Whittaker-Ziolkowski, with hidden bidirectional EM wavepairs (their sums and products). Note that this constitutes an EM application of Bohm-type hidden variable theory, with many ramifications.

"...curiously enough, we do not know exactly what charge is, only what it does. Or, equally significantly, what it does not do."

M.P. Silverman, And Yet It Moves: Strange Systems and Subtle Questions in Physics, Cambridge University Press, 1993, p. 127.

An electric charge Q consists of a massless flux component and a mass component, coupled together (interacting). Q is a broken symmetry. The mass of the charge continually and violently exchanges virtual photons with the surrounding vacuum.


Thus Q is energetically driven by the surrounding vacuum potential, which itself is to first order just a violent virtual photon flux.

The Ubiquitous Assumption: Two Asymmetrical Regaugings for Net Symmetry

You really need
a Maxwell's demon,
to do some free work.

Your electrodynamicist
says he can make one,
by regauging.

The Ubiquitous Assumption: *Two* Asymmetrical Regaugings for Net Symmetry

He says he will do the regauging for you. Hey, what a swell guy!

He regauges *twice*, and makes two Maxwell's demons equal and opposite. They won't do any net work for you!

The Ubiquitous Assumption: Two Asymmetrical Regaugings for Net Symmetry

He disdainfully says, "We *always* do it that way! We *must* enforce local equilibrium and the second law of thermodynamics!".

You decide to have a little chat with your electrodynamicist! With friends like that, who needs enemies!

A Charged Particle Is a Coupled System

(The first formal definition of charge)

$$q \equiv \phi_q \times m_q$$

Note: X is a coupling operator

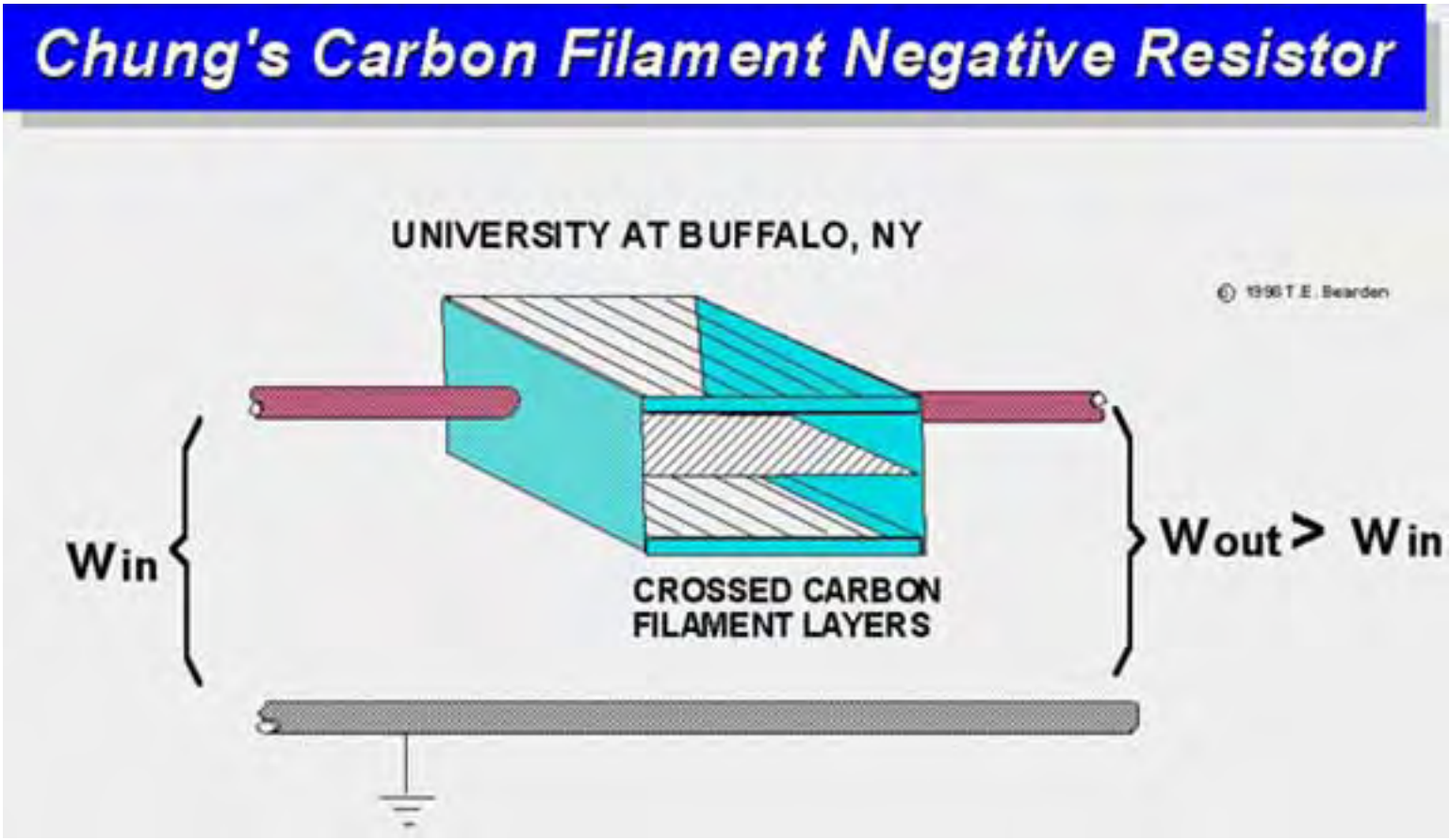
virtual photon flux exchange

ϕ_q

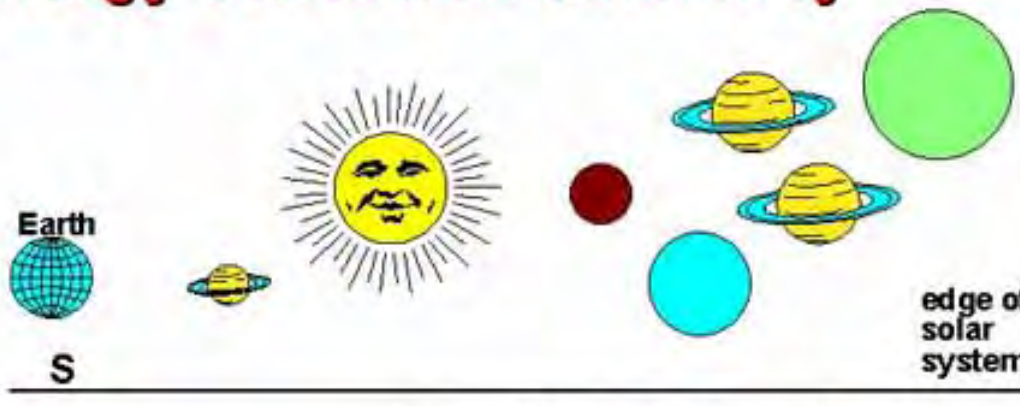
"...curiously enough, we do not know exactly what charge is, only what it does. Or, equally significantly, what it does not do."

M.P. Silverman, And Yet It Moves: Strange Systems and Subtle Questions in Physics, Cambridge University Press, 1993, p. 127.

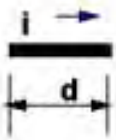
An electric charge q is a broken symmetry in its fierce energy exchange with the active vacuum. It coherently integrates some of the virtual energy absorbs and outputs it as Poynting energy flow.


Chung's Carbon Filament Negative Resistor
UNIVERSITY AT BUFFALO, NY
© 1996 T.E. Bearden
Win
Wout > Win
CROSSED CARBON
FILAMENT LAYERS

Typical circuit has about 10^{-13} energy collection efficiency



Distance traveled by S in one hour is 1.08x10exp(12) meters.



Example: 1.3 amps flowing in DC circuit, 1.8 mm diameter copper wire. $J = 51$ A/cm ^{2}

$d_i = 0.1368$ meters

S violently transports ϕ provided from the source.
jϕ sluggishly transports the energy collected and dissipated in the circuit..

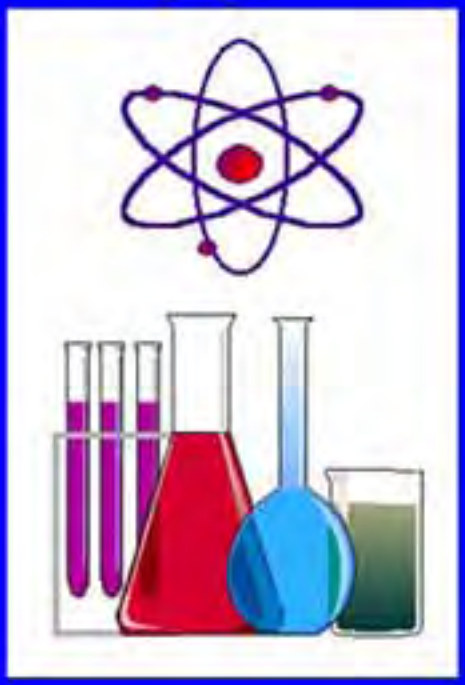
For the case discussed, the electron drift velocity in the circuit is about 3.8×10^{-5} meters/sec. So Jϕ moves about 0.1368 meters in one hour. Thus Jϕ has collected about 0.1368 meters of the ϕ-filled S-tube. During that same hour, the S-flow evoked by the power source will have traveled 1.08×10^{12} meters. The ϕ of both currents is the same. Both are involved in the same energy-filled tube. Thus S has provided and transported about 7.89×10^{12} times as much energy along the circuit in one hour as the jϕ has been able to collect, transport, and dissipate as work in the circuit. Thus this circuit provides about 10^{13} collection efficiency.

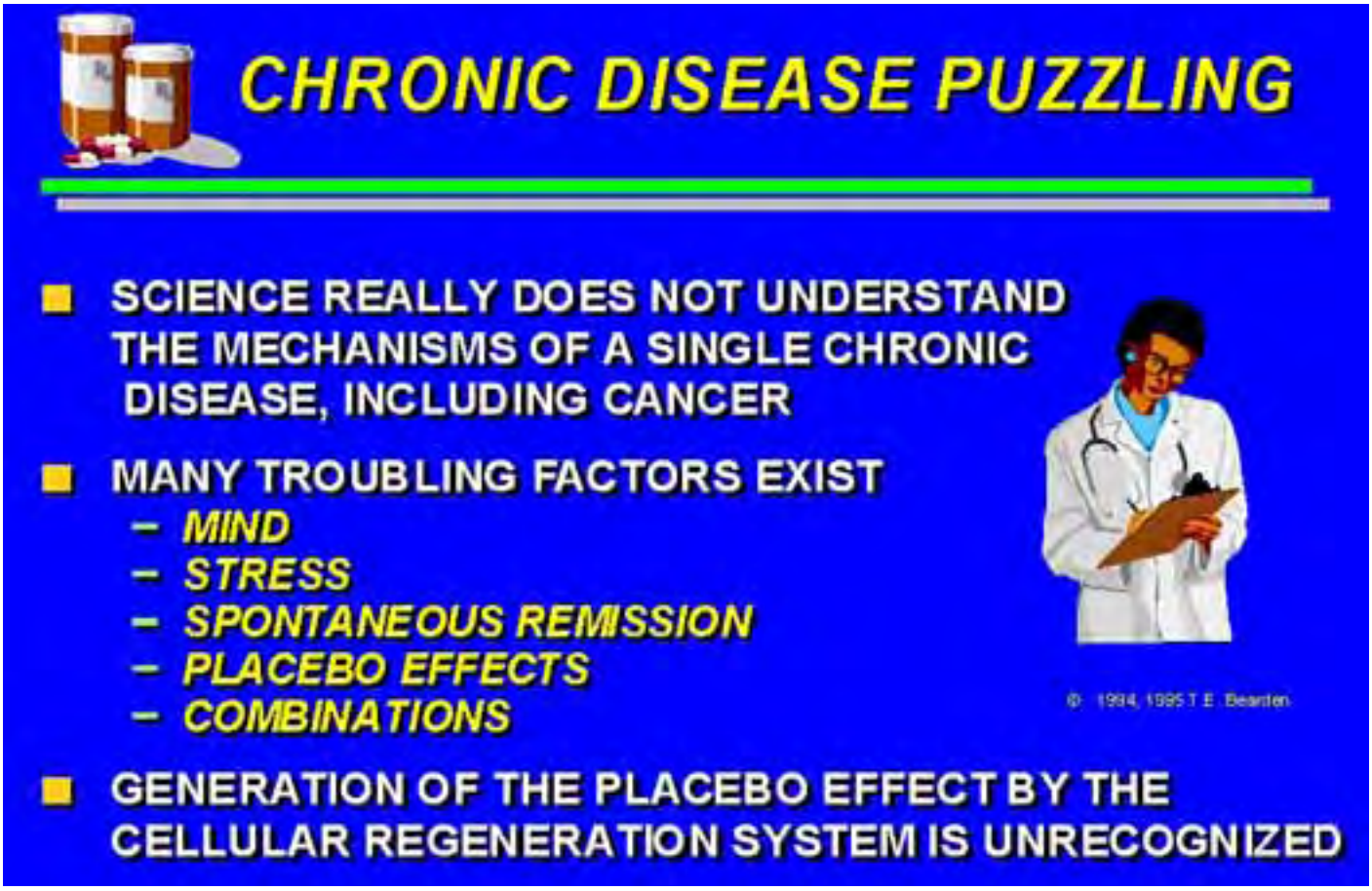
Classical View of EM

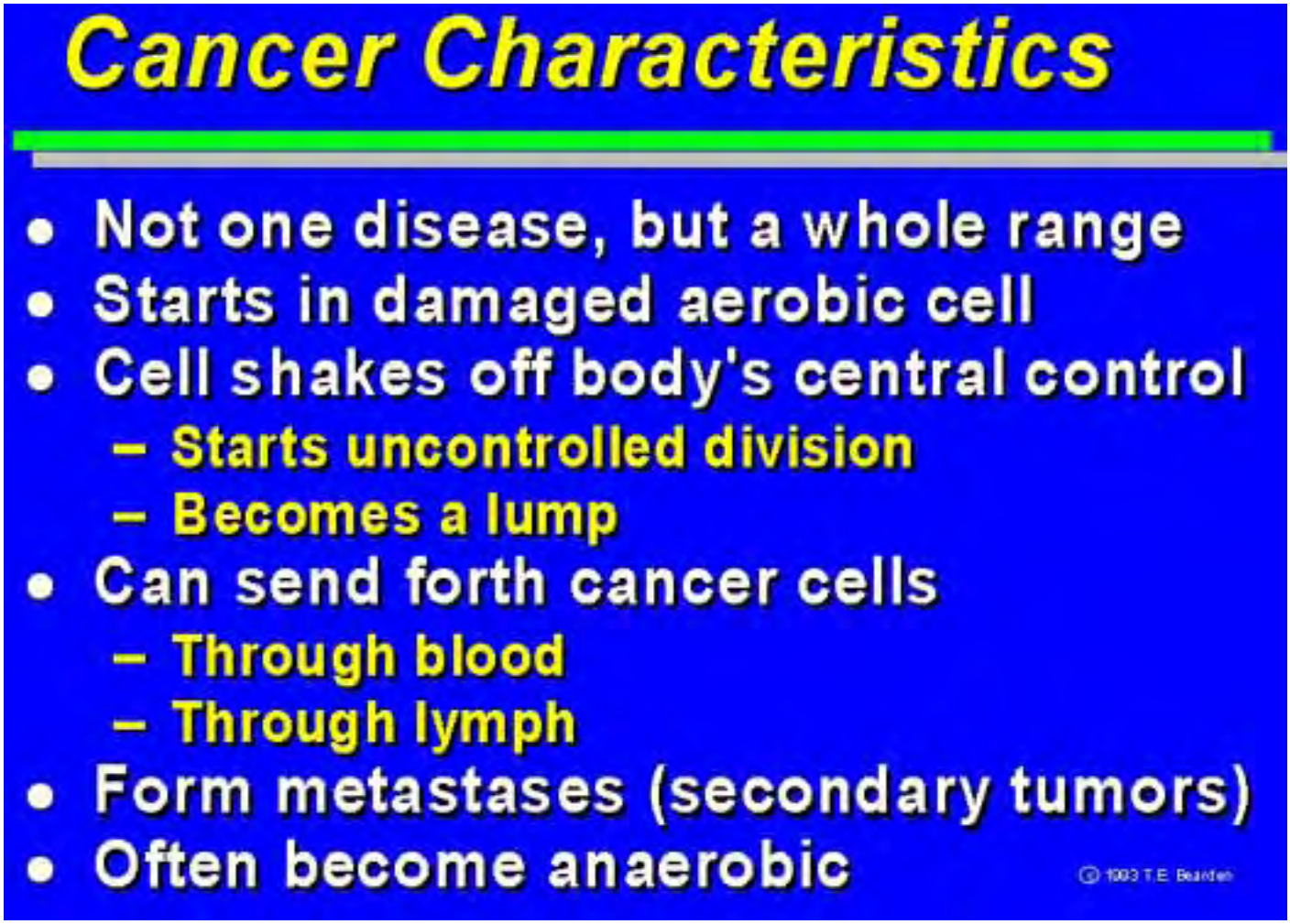
- Potentials just mathematical conveniences
  - Not real
  - No internal structure, just magnitude
- Force fields primary, causative, can exist in space in absence of observable mass
  - All EM actions due to force fields, none when zero
  - No action at a distance
- Vacuum empty; without energy or structure
  - No locally curved spacetime
  - No gravity effects
  - No quantum effects
- Maxwell's equations complete
  - Symmetrically regauged ***arbitrarily***
  - Topology dramatically reduced

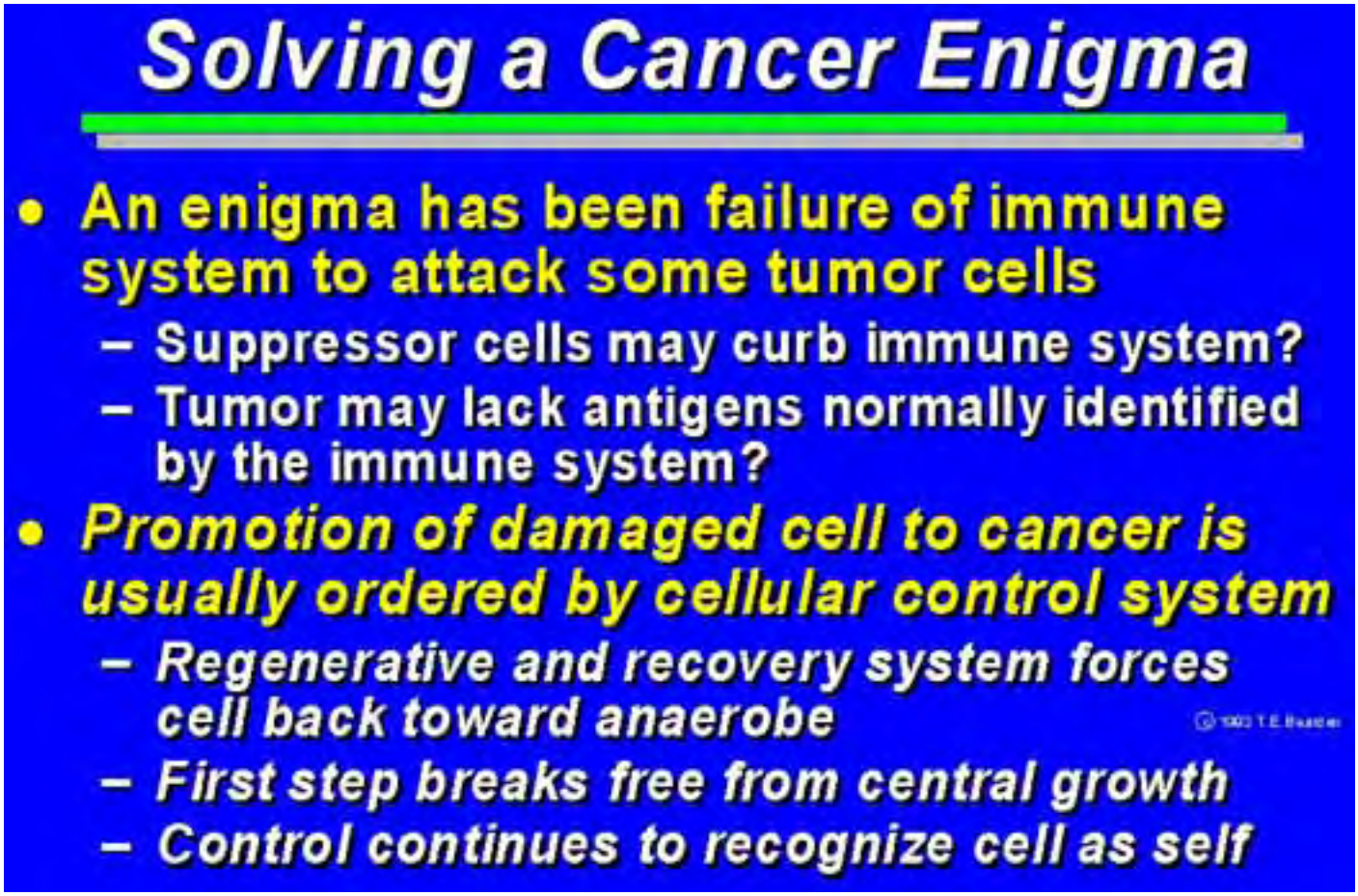
Curved Spacetime acts as source or sink

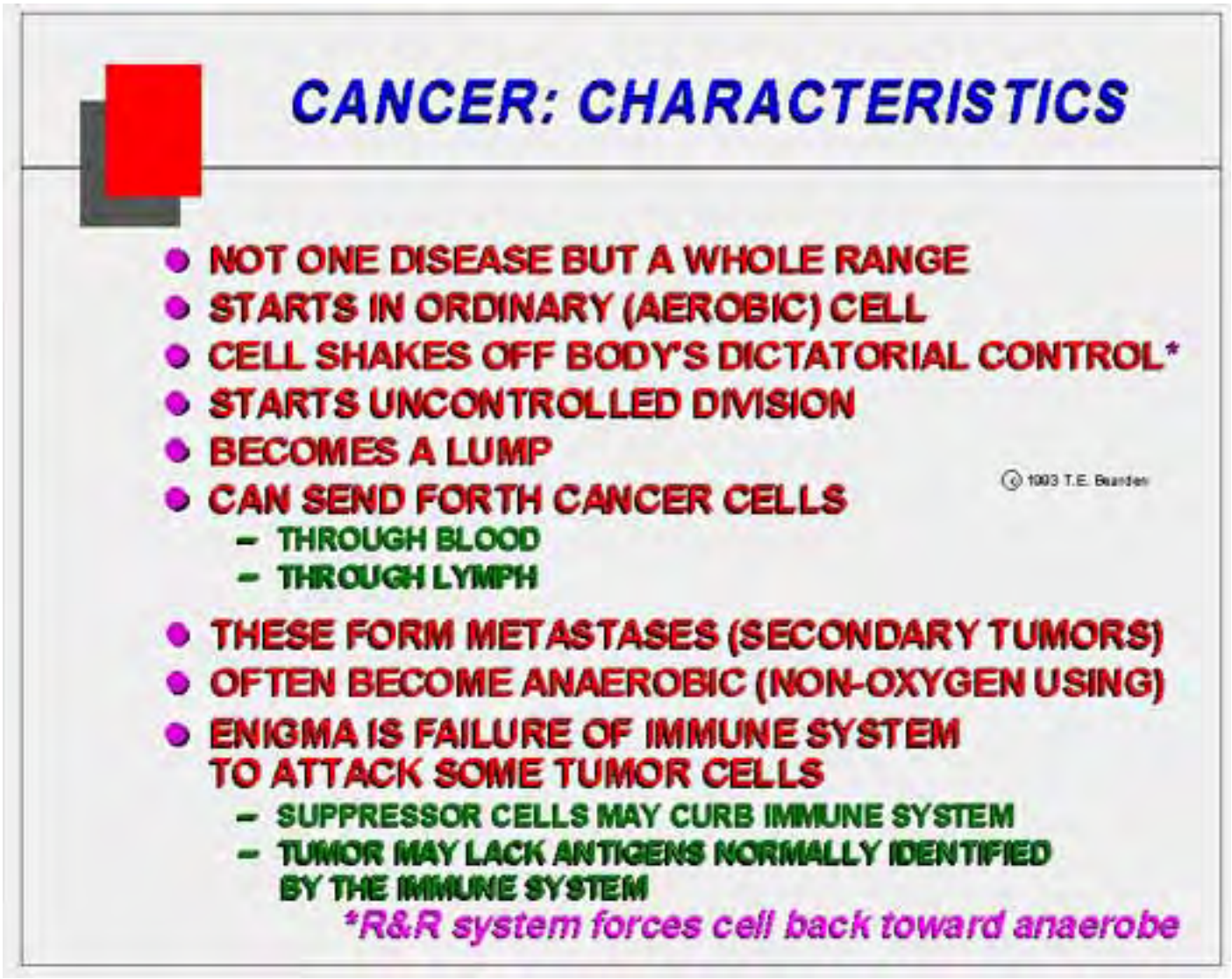
- May emit excess radiation and energy (e.g., heat)
- May absorb radiation and energy (e.g., cool)
- May transduce waves TW ⇔ LW ⇔ TDW
- New energy conservation law applies



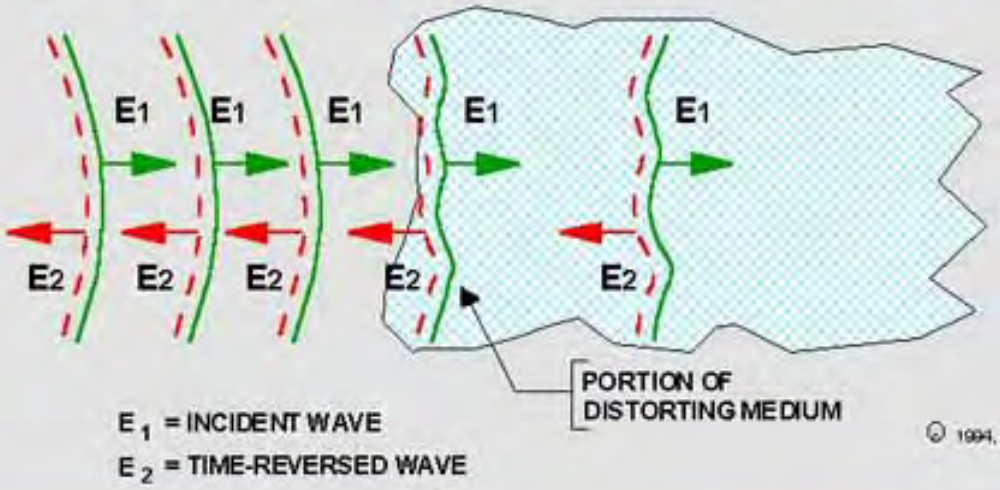

CHRONIC DISEASE PUZZLING
SCIENCE REALLY DOES NOT UNDERSTAND THE MECHANISMS OF A SINGLE CHRONIC DISEASE, INCLUDING CANCER
MANY TROUBLING FACTORS EXIST
– MIND
– STRESS
– SPONTANEOUS REMISSION
– PLACEBO EFFECTS
– COMBINATIONS
GENERATION OF THE PLACEBO EFFECT BY THE CELLULAR REGENERATION SYSTEM IS UNRECOGNIZED
© 1994, 1995 T E Bearden


Cancer Characteristics
• Not one disease, but a whole range
• Starts in damaged aerobic cell
• Cell shakes off body's central control
– Starts uncontrolled division
– Becomes a lump
• Can send forth cancer cells
– Through blood
– Through lymph
• Form metastases (secondary tumors)
• Often become anaerobic
© 1993 T.E. Bearden


Solving a Cancer Enigma
• An enigma has been failure of immune system to attack some tumor cells
– Suppressor cells may curb immune system?
– Tumor may lack antigens normally identified by the immune system?
• Promotion of damaged cell to cancer is usually ordered by cellular control system
– Regenerative and recovery system forces cell back toward anaerobe
– First step breaks free from central growth
– Control continues to recognize cell as self


CANCER: CHARACTERISTICS
NOT ONE DISEASE BUT A WHOLE RANGE
STARTS IN ORDINARY (AEROBIC) CELL
CELL SHAKES OFF BODY'S DICTATORIAL CONTROL*
STARTS UNCONTROLLED DIVISION
BECOMES A LUMP
CAN SEND FORTH CANCER CELLS
- THROUGH BLOOD
- THROUGH LYMPH
© 1993 T.E. Bearden
THESE FORM METASTASES (SECONDARY TUMORS)
OFTEN BECOME ANAEROBIC (NON-OXYGEN USING)
ENIGMA IS FAILURE OF IMMUNE SYSTEM TO ATTACK SOME TUMOR CELLS
- SUPPRESSOR CELLS MAY CURB IMMUNE SYSTEM
- TUMOR MAY LACK ANTIGENS NORMALLY IDENTIFIED BY THE IMMUNE SYSTEM
*R&R system forces cell back toward anaerobe

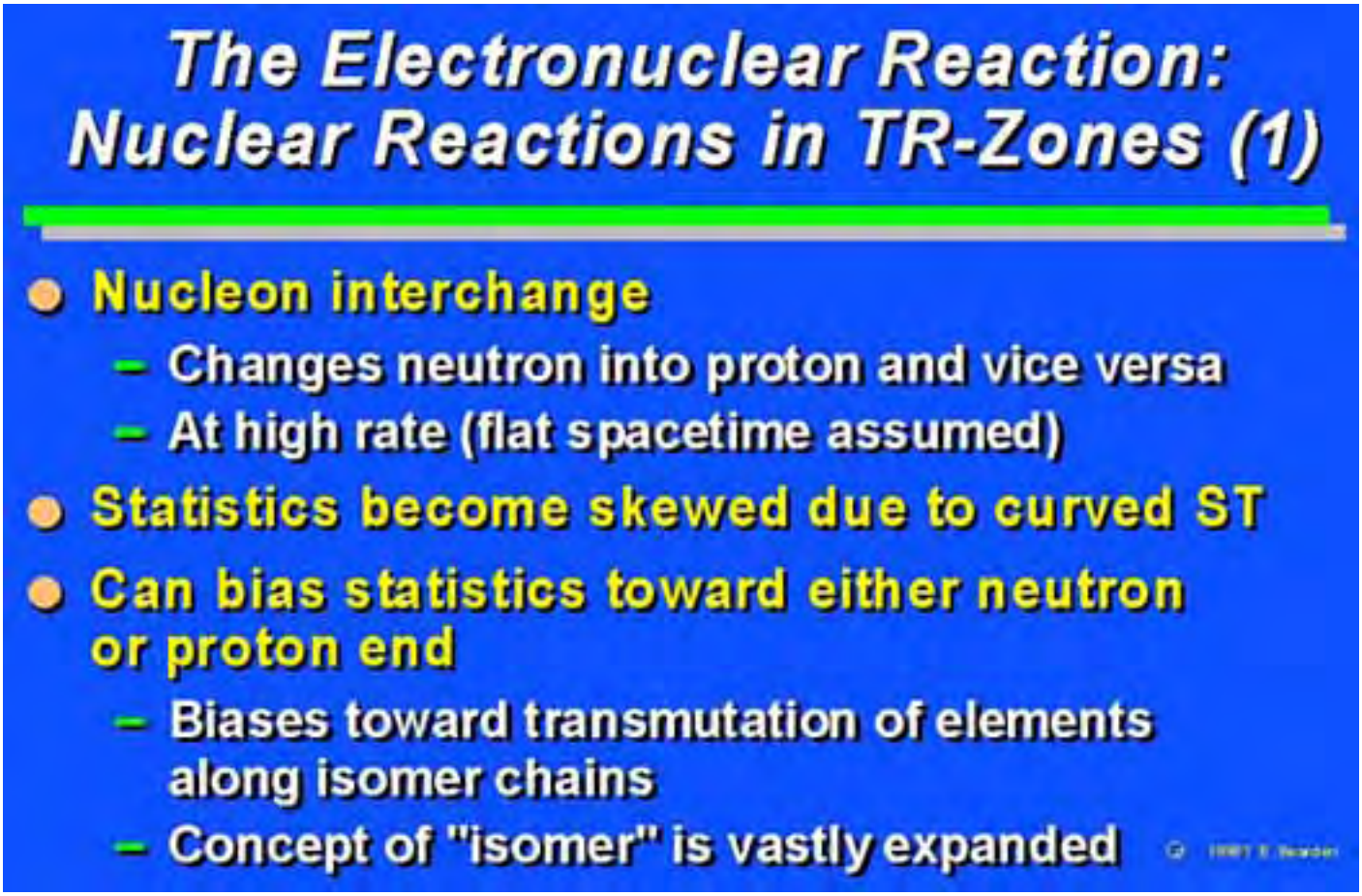
Nonlinear Optics
Distortion Correction Theorem

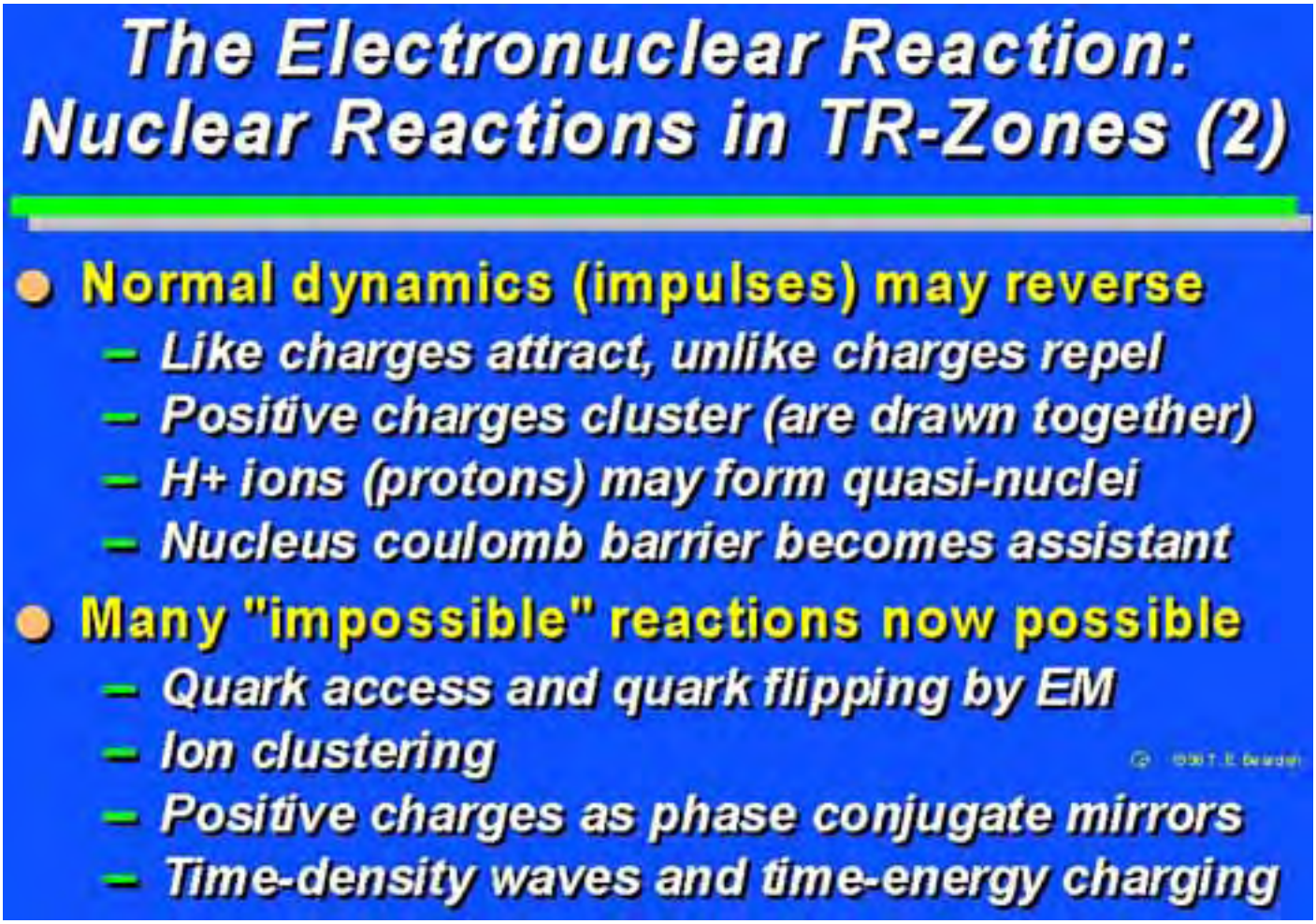


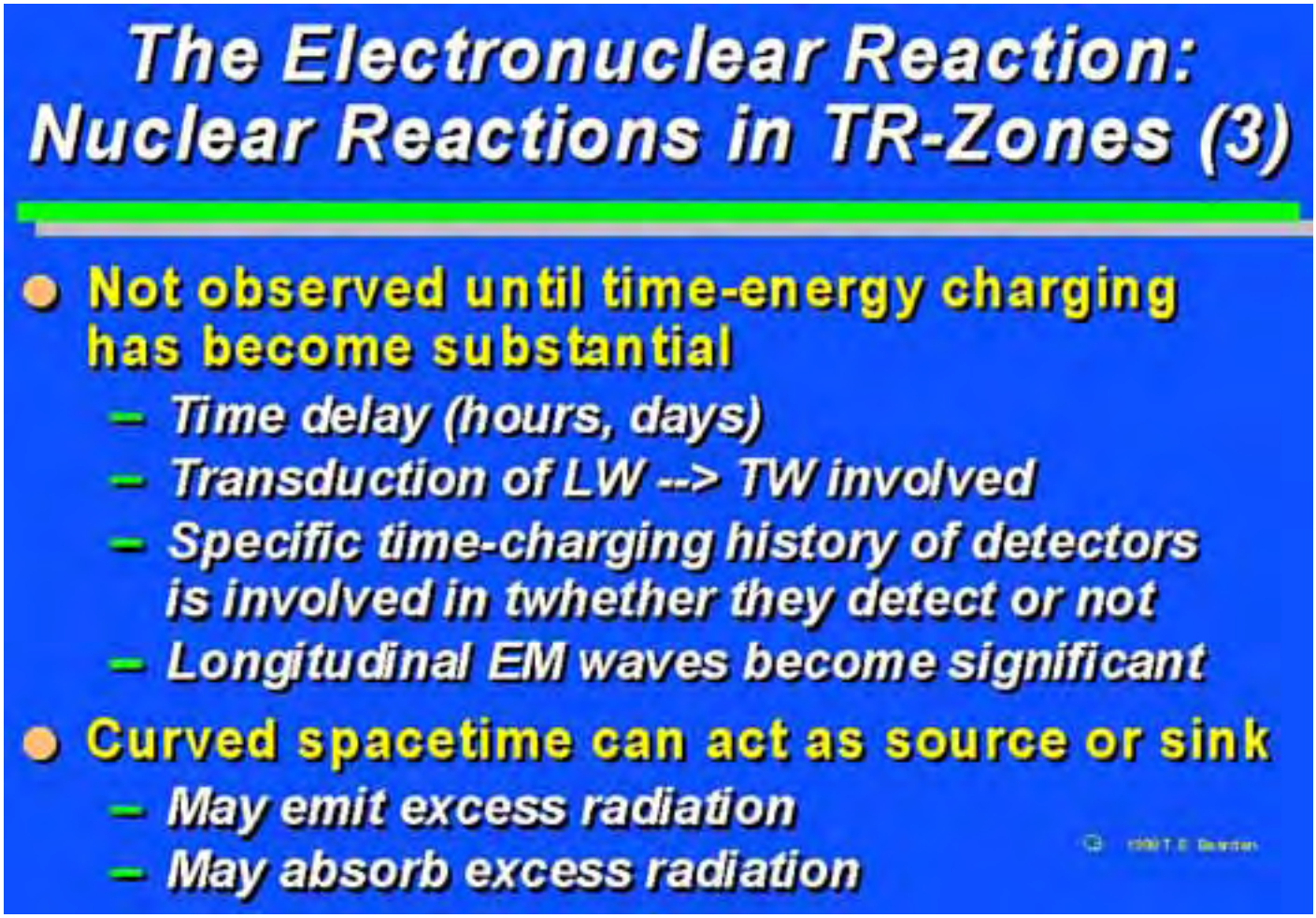
E_1 = INCIDENT WAVE

E_2 = TIME-REVERSED WAVE

"If a scalar wave $E_1(r)$ propagates from left to right through an arbitrary but lossless dielectric medium, and if we generate in some region of space [say near z = 0] its phase conjugate replica $E_2(r)$, then E_2 will propagate backward from right to left through the dielectric medium, remaining everywhere the phase conjugate of E_1."

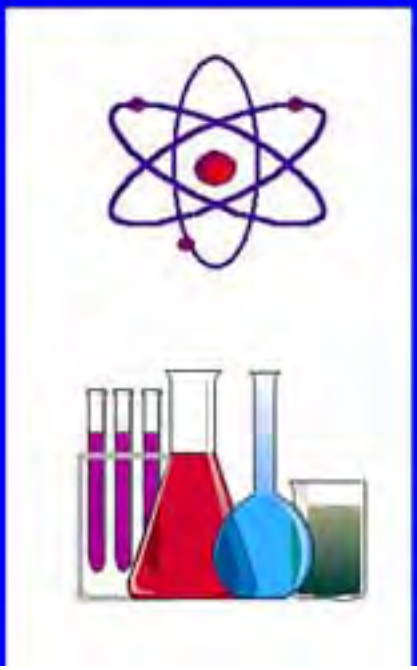

The Electronuclear Reaction:
Nuclear Reactions in TR-Zones (1)
Nucleon interchange
Changes neutron into proton and vice versa
At high rate (flat spacetime assumed)
Statistics become skewed due to curved ST
Can bias statistics toward either neutron or proton end
Biases toward transmutation of elements along isomer chains
Concept of "isomer" is vastly expanded


The Electronuclear Reaction:
Nuclear Reactions in TR-Zones (2)
Normal dynamics (impulses) may reverse
– Like charges attract, unlike charges repel
– Positive charges cluster (are drawn together)
– H+ ions (protons) may form quasi-nuclei
– Nucleus coulomb barrier becomes assistant
Many "impossible" reactions now possible
– Quark access and quark flipping by EM
– Ion clustering
– Positive charges as phase conjugate mirrors
– Time-density waves and time-energy charging


The Electronuclear Reaction:
Nuclear Reactions in TR-Zones (3)
Not observed until time-energy charging has become substantial
Time delay (hours, days)
Transduction of LW --> TW involved
Specific time-charging history of detectors is involved in twhether they detect or not
Longitudinal EM waves become significant
Curved spacetime can act as source or sink
May emit excess radiation
May absorb excess radiation

In Time-Reversed Zone:
Nuclear reactions are biased

- In normal flat ST, n ⇔ p at high rate
- Curved ST skews statistics
- Biases to either n or p
- Biases to transmutation along isomer chain
- "Isomer" concept greatly expanded



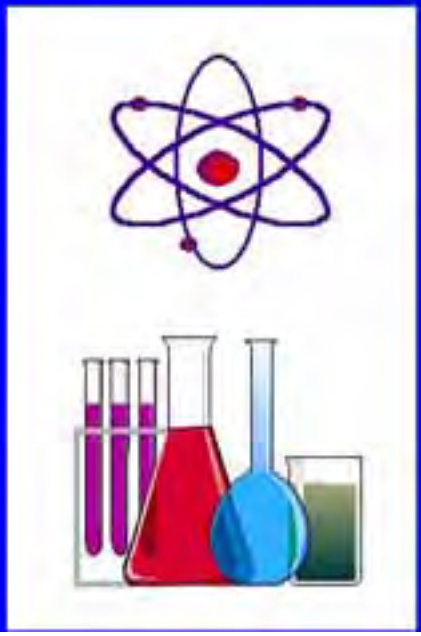
In Time-Reversed Zone:
Dynamics may be reversed

- Like charges may attract and unlike charges repel
- Coulomb barrier becomes Coulomb assistant
- Clusters like charges and forms artificial nuclei
- "Impossible" nuclear reactions at low energy
- Time-density interactions

Time-Reversed Zone:

Significant only after time-density charging

- Hours, for "fast" onset
- Days, for "slower" onset
- Transduction involved for TW ⇔ LW ⇔ TDW
- Time-history of each detector is significant
- Longitudinal EM waves become significant



A New Conservation of Energy Law

- Physics conserves total "energy and mass-energy"
- Now also must consider "time-energy"
- Conserve total mass-time-energy (spatiotemporal energy)
- Let E_T = total energy, E_M = mass energy, E_E = ordinary energy, and E_t = time energy. Then

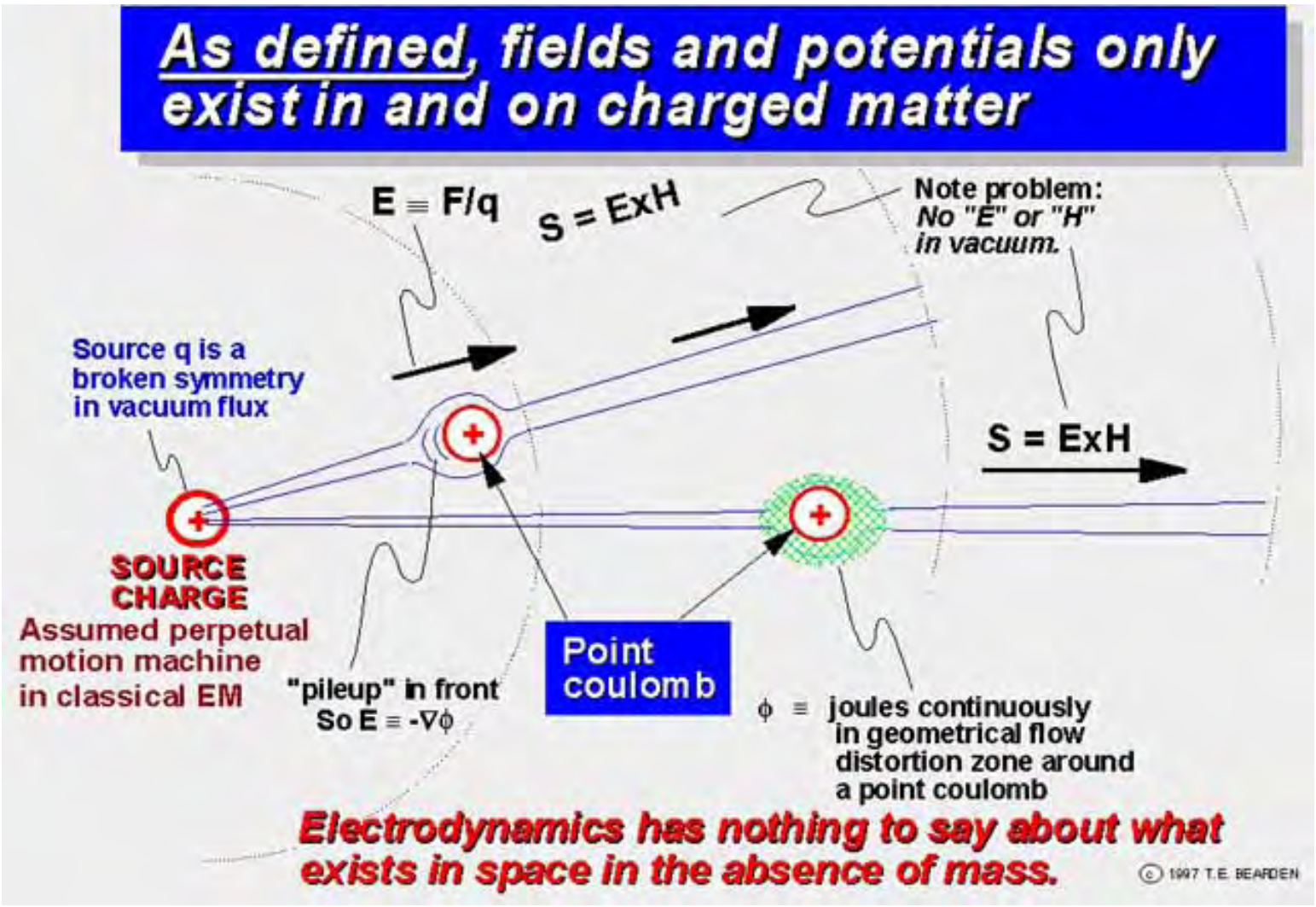
$$E_T = E_E + E_M + E_t$$

$$(kE_t \Rightarrow E_E > 0) \Rightarrow E_T > (E_M + E_E)$$

- If some E_t is transduced into E_E, the experiment will violate the old spatial mass-energy conservation law

QUESTIONS ON CARCINOGENS AND EM RADIATION

- UNRESOLVED QUESTIONS ON EM RADIATION
  - DOSAGES
  - ACTIVE MECHANISMS
  - REPLICATION DIFFICULTIES
  - MEASUREMENT DIFFICULTIES
  - WHERE, WHEN, HOW ILL EFFECTS OCCUR
- SIMILAR QUESTIONS EXIST ABOUT EVERY CARCINOGEN
- SCIENCE REALLY DOES NOT UNDERSTAND THE MECHANISMS OF A SINGLE CHRONIC DISEASE, INCLUDING CANCER
  - FACTORS SUCH AS MIND, STRESS, SPONTANEOUS REMISSION, PLACEBO EFFECTS, AND COMBINATIONS OF FACTORS ARE PARTICULARLY TROUBLESOME
  - GENERATION OF THE PLACEBO EFFECT BY THE REGENERATION & RECOVERY SYSTEM IS UNRECOGNIZED


As defined, fields and potentials only exist in and on charged matter
E ≡ F/q
S = ExH
Note problem:
No "E" or "H"
in vacuum.
Source q is a
broken symmetry
in vacuum flux
S = ExH
SOURCE
CHARGE
Assumed perpetual
motion machine
in classical EM
"pileup" in front
So E ≡ -∇ϕ
Point
coulomb
ϕ ≡ joules continuously
in geometrical flow
distortion zone around
a point coulomb
Electrodynamics has nothing to say about what exists in space in the absence of mass.
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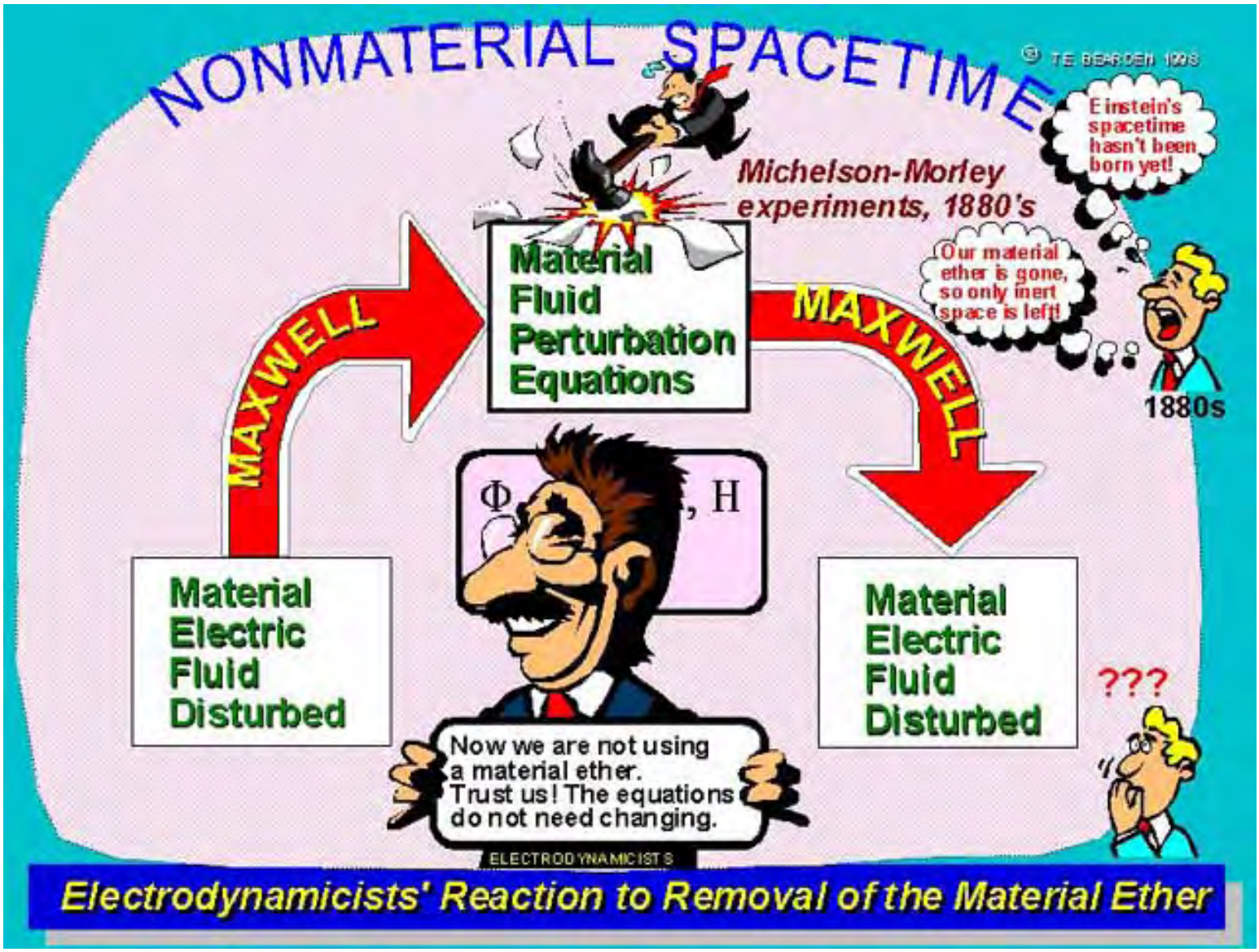
Serious flaws and errors in classical EM theory.

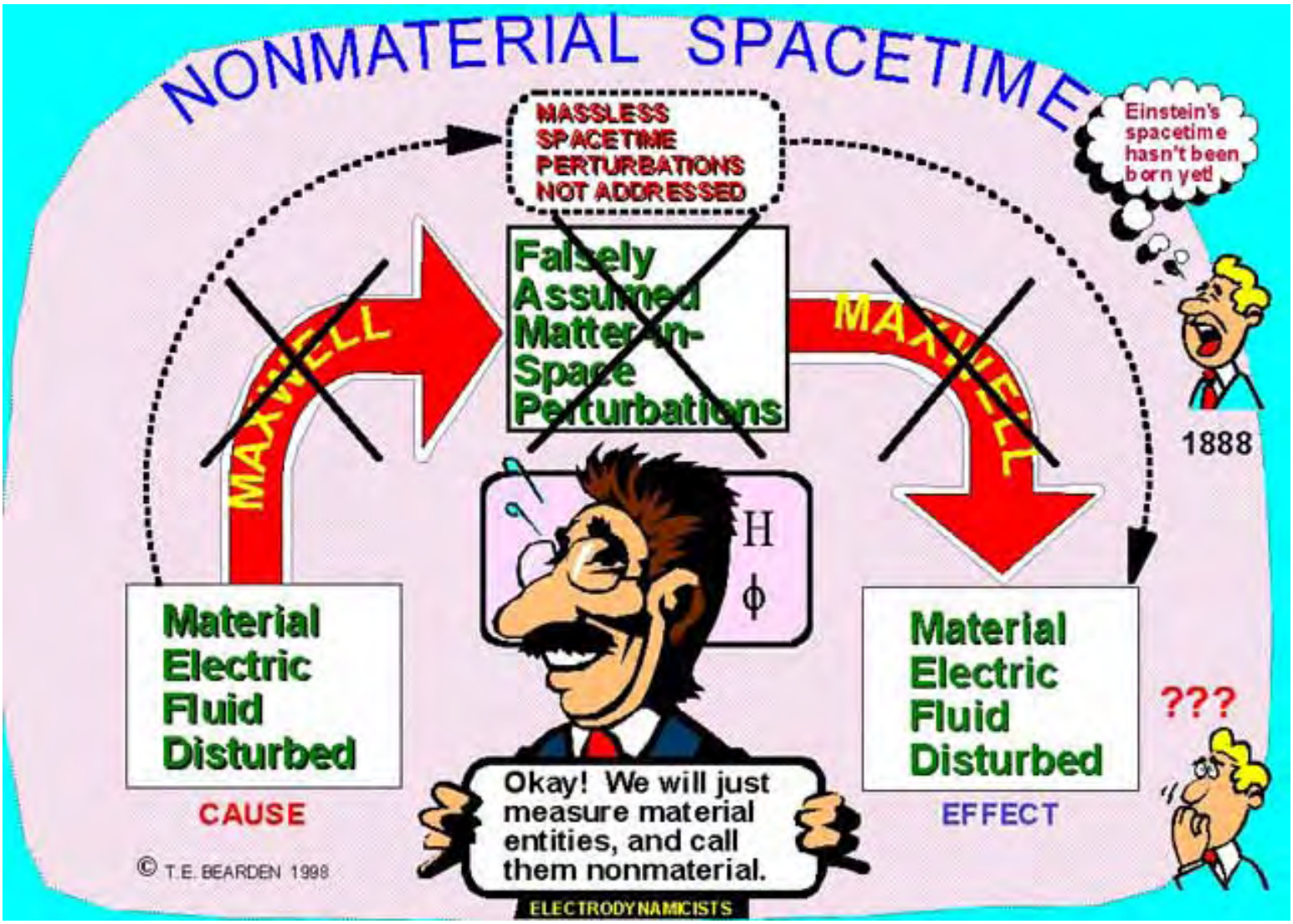
1. Eliminates the Internal EM Inside the Scalar Potential.
2. No Definition of Electrical Charge or of Scalar Potential.
3. Equations Still Assume Material Ether Per Maxwell (Unchanged).
4. Use of Force Fields in Vacuum is False (and Known to be So).
5. Treats Charge q as Unitary Instead of Coupled System $q = \phi[q]m(q)$.
6. Confuses Massless Potential Gradients as Forces (See #3, #4).
7. Does Not Utilize Mass as a Component of Force (See #23).

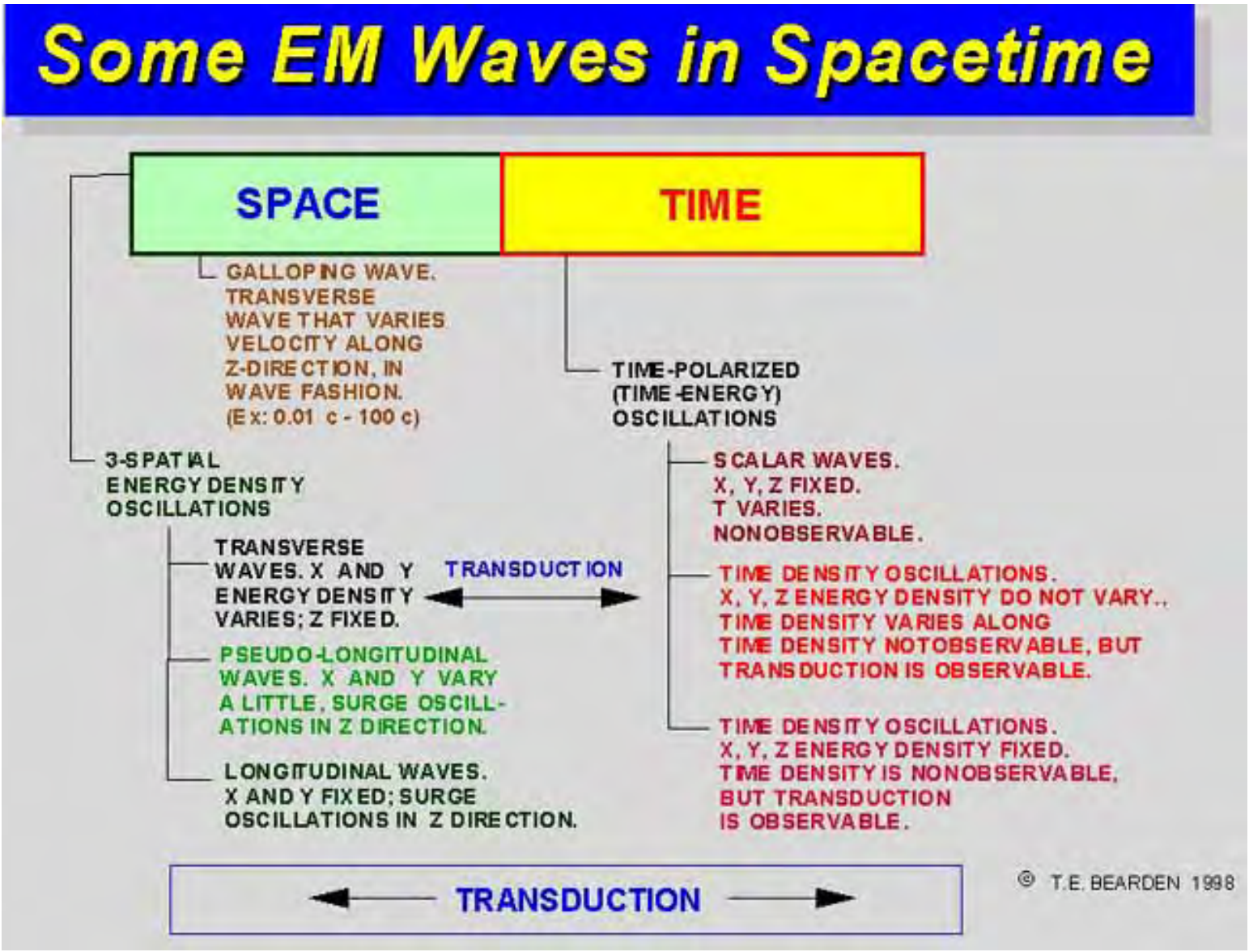
8. Erroneously Assumes EM Force Fields as Primary Causes.
9. Topology of EM Model Has Been Substantially Reduced.
10. Does Not Include Quantum Potential or Action at a Distance.
11. Does Not Include Superluminal Velocity of Inner EM Components.
12. Does Not Utilize Extended Near-Field Coulomb Gauge Effects.
13. Does Not Include EM Generatrix Mechanism for Time Flow.
14. Does Not Unify Photon and Wave Aspects (Requires 7-D Model).

15. Does Not Include Electron Spin and Precession (See #19, #24).
16. Treats EM Energy As Existing In "Chunks," Instead of as Flow.
17. Confuses Energy and Energy Collection (See #16).
18. Discards Half of Every EM Wave in Vacuum (See #22).
19. Erroneously Uses Transverse Vacuum Wave; It's Longitudinal.
20. Arbitrarily Regauges Maxwell's Equations to Eliminate Overunity.
21. Omits Phase Conjugate Optics Effects (The *Rule* in Internal EM).
22. Does Not Include EM Cause of Newtonian Reaction Force.
23. Erroneously Assumes Separate Force Acting on Separate Mass.
24. Confuses Detected Electron Precession Waves as Proving Transverse EM Waves in Vacuum (Remnant of Old "EM Fluid" Concept).
25. Due to Error in String Wave, Omits the Ubiquitous Antiwave.
26. *Assumes* Equilibrium; Not True Unless Include Vacuum Interactions.
27. Higher Topology Required, to Model Electromagnetic Reality.
28. Lorentz surface integration discards Poynting energy transport.
29. Has nothing at all to say about form of EM entities in massless space.
30. Eliminates the infolded general relativity using EM-force as curve agent.
31. Does not include longitudinal EM waves as time domain oscillations.
32. Does not include EM mechanism that generates time flow and flow rate.

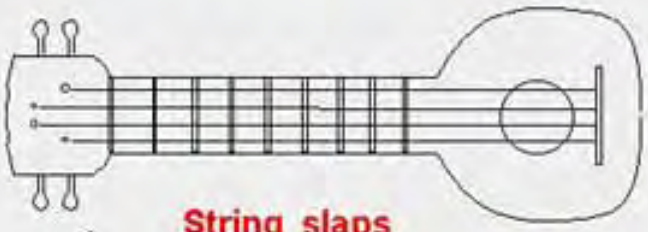

NONMATERIAL SPACETIME
© T.E. BEARDEN 1998
Einstein's spacetime hasn't been born yet!
Michelson-Morley experiments, 1880's
Our material ether is gone, so only inert space is left!
1880s
MAXWELL
Material Fluid Perturbation Equations
MAXWELL
Material Electric Fluid Disturbed
Material Electric Fluid Disturbed
???
Now we are not using a material ether. Trust us! The equations do not need changing.
ELECTRODYNAMICISTS
Electrodynamicists' Reaction to Removal of the Material Ether


REACTION TO LOSS OF MATERIAL ETHER
Material Ether Assumed in Equations
Potentials, Fields, and Waves Assumed Material
Not a single equation was changed!
Now we are not using a material ether. Trust us! The equations do not need changing.
© T.E. BEARDEN 1999
ELECTRODYNAMICISTS


NONMATERIAL SPACETIME
MASSLESS SPACETIME PERTURBATIONS NOT ADDRESSED
Einstein's spacetime hasn't been born yet!
Falsely Assumed Matter-in-Space Perturbations
MAXWELL
MAXWELL
1888
H
ϕ
Material Electric Fluid Disturbed
CAUSE
Material Electric Fluid Disturbed
EFFECT
???
Okay! We will just measure material entities, and call them nonmaterial.
ELECTRODYNAMICISTS
© T.E. BEARDEN 1998


Some EM Waves in Spacetime
SPACE
TIME
GALLOPING WAVE. TRANSVERSE WAVE THAT VARIES VELOCITY ALONG Z-DIRECTION, IN WAVE FASHION. (Ex: 0.01 c - 100 c)
TIME-POLARIZED (TIME-ENERGY) OSCILLATIONS
3-SPATIAL ENERGY DENSITY OSCILLATIONS
SCALAR WAVES. X, Y, Z FIXED. T VARIES. NONOBSERVABLE.
TRANSVERSE WAVES. X AND Y ENERGY DENSITY VARIES; Z FIXED.
TRANSDUCTION
TIME DENSITY OSCILLATIONS. X, Y, Z ENERGY DENSITY DO NOT VARY.. TIME DENSITY VARIES ALONG TIME DENSITY NOTOBSERVABLE, BUT TRANSDUCTION IS OBSERVABLE.
PSEUDO-LONGITUDINAL WAVES. X AND Y VARY A LITTLE, SURGE OSCILLATIONS IN Z DIRECTION.
TIME DENSITY OSCILLATIONS. X, Y, Z ENERGY DENSITY FIXED. TIME DENSITY IS NONOBSERVABLE, BUT TRANSDUCTION IS OBSERVABLE.
LONGITUDINAL WAVES. X AND Y FIXED; SURGE OSCILLATIONS IN Z DIRECTION.
TRANSDUCTION
© T.E. BEARDEN 1998

Air Medium Disturbances Generated When Air is Perturbed by a Plucked Taut String



The string wave and the holder wave never leave the string and holder respectively.

String slaps air medium

Wave is alternatively compressive and rarefactive

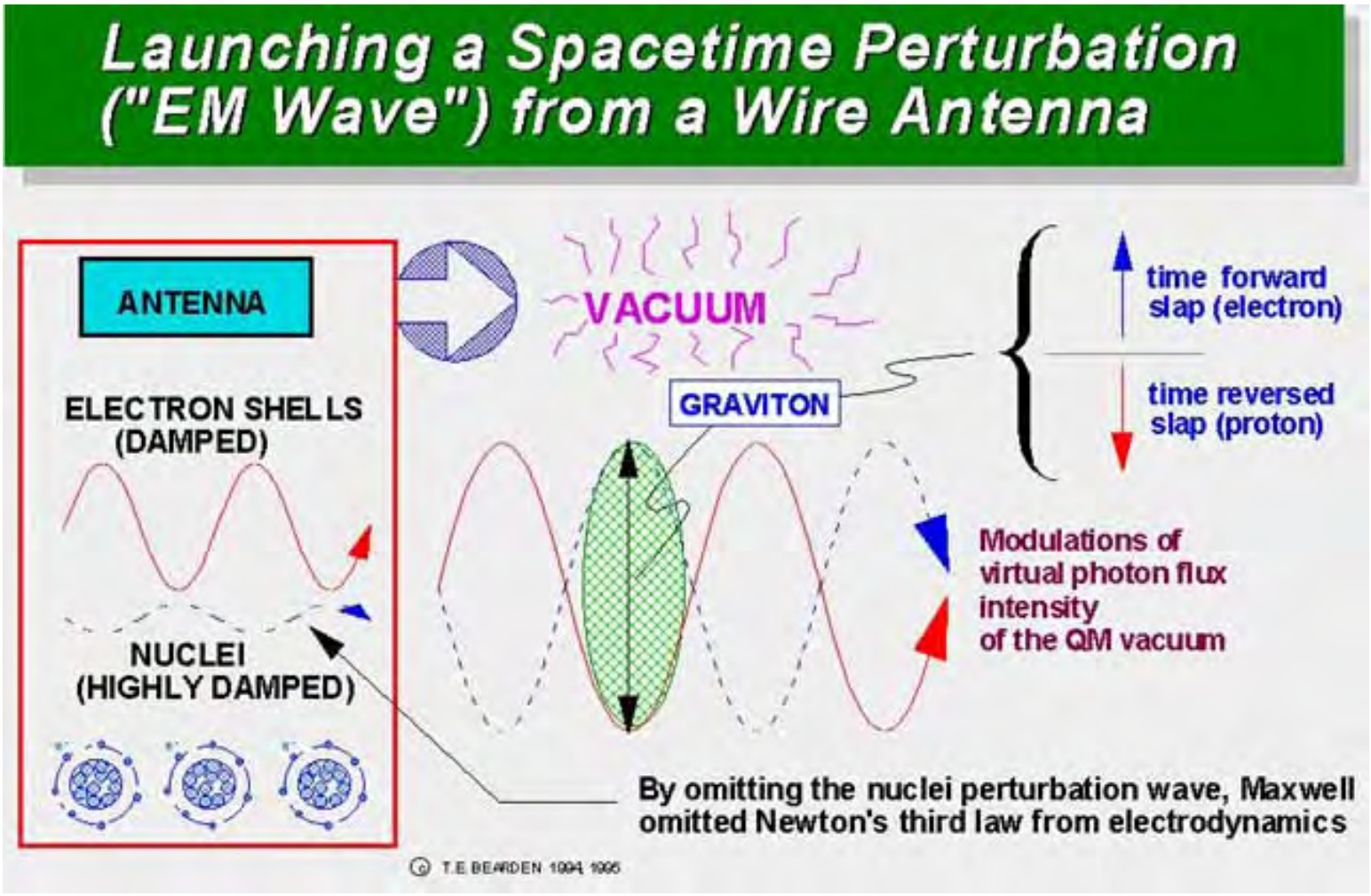
WAVE IN STRING (TRANSVERSE)
Lower degree of freedom for string.
Can only vibrate mostly laterally.

Drude Electron Gas waves

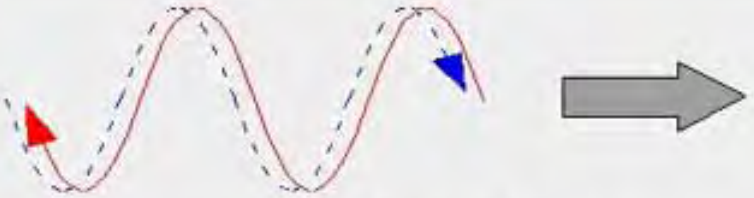
Nuclear proton waves

ANTIWAVE IN HOLDER
(Highly damped; not shown to scale)

Body slaps air medium

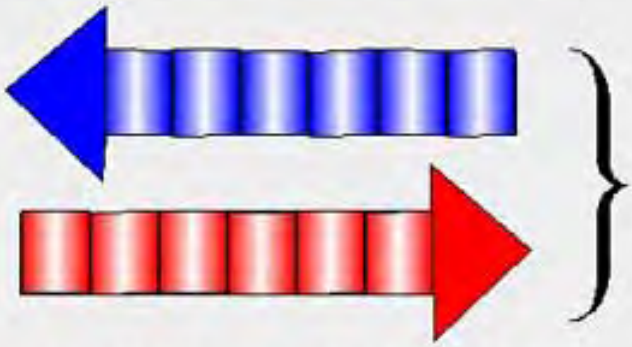

Launching a Spacetime Perturbation ("EM Wave") from a Wire Antenna
ANTENNA
ELECTRON SHELLS (DAMPED)
NUCLEI (HIGHLY DAMPED)
VACUUM
GRAVITON
time forward slap (electron)
time reversed slap (proton)
Modulations of virtual photon flux intensity of the QM vacuum
By omitting the nuclei perturbation wave, Maxwell omitted Newton's third law from electrodynamics
© T.E BEARDEN 1994 1995

Phase Conjugate Wavepairs Produce New Waves

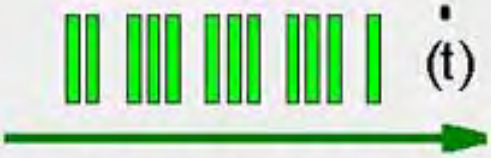


TRANSVERSE EM WAVE PLUS
PHASE CONJUGATE REPLICA WAVE

LONGITUDINAL EM SURGE WAVE

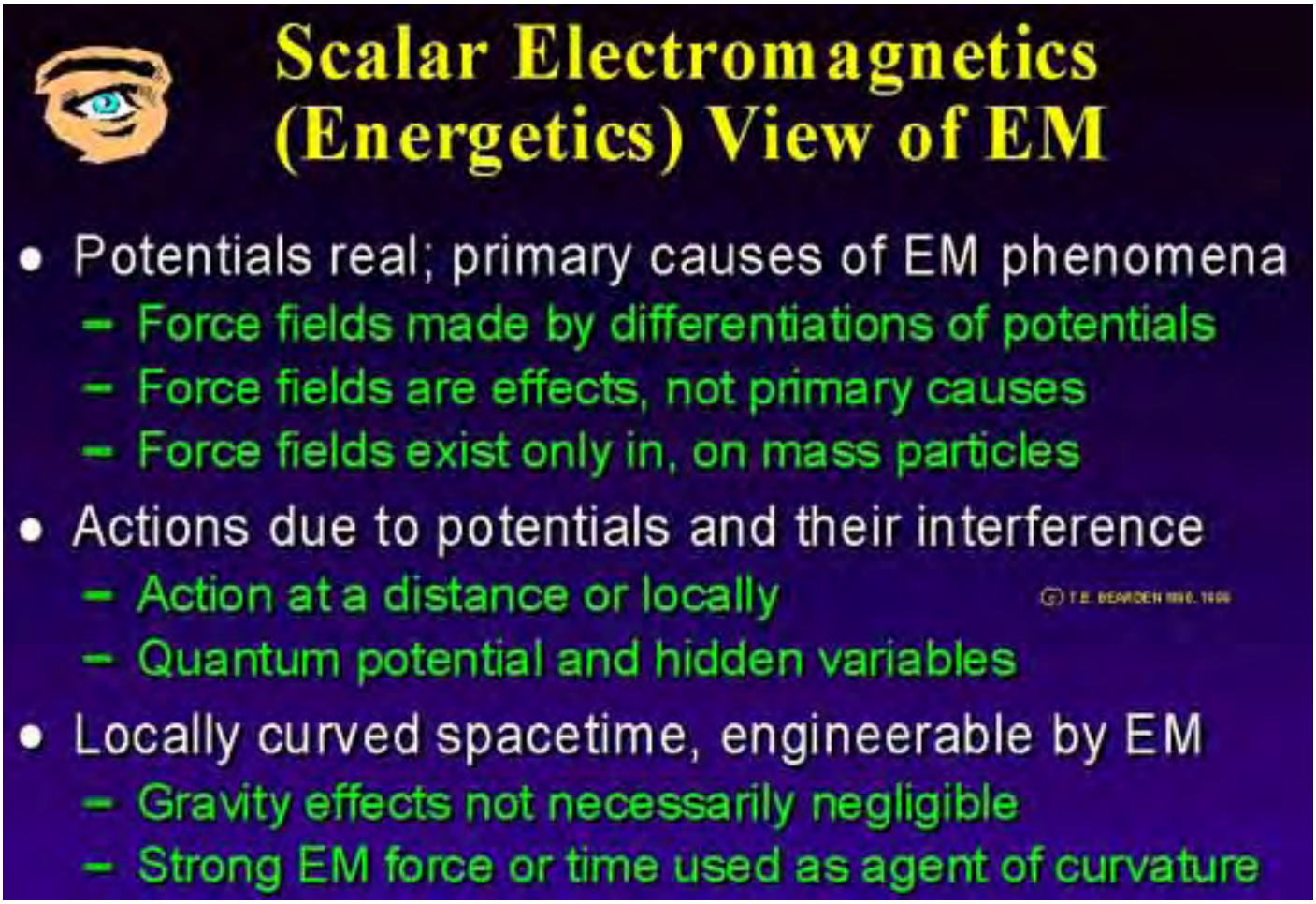


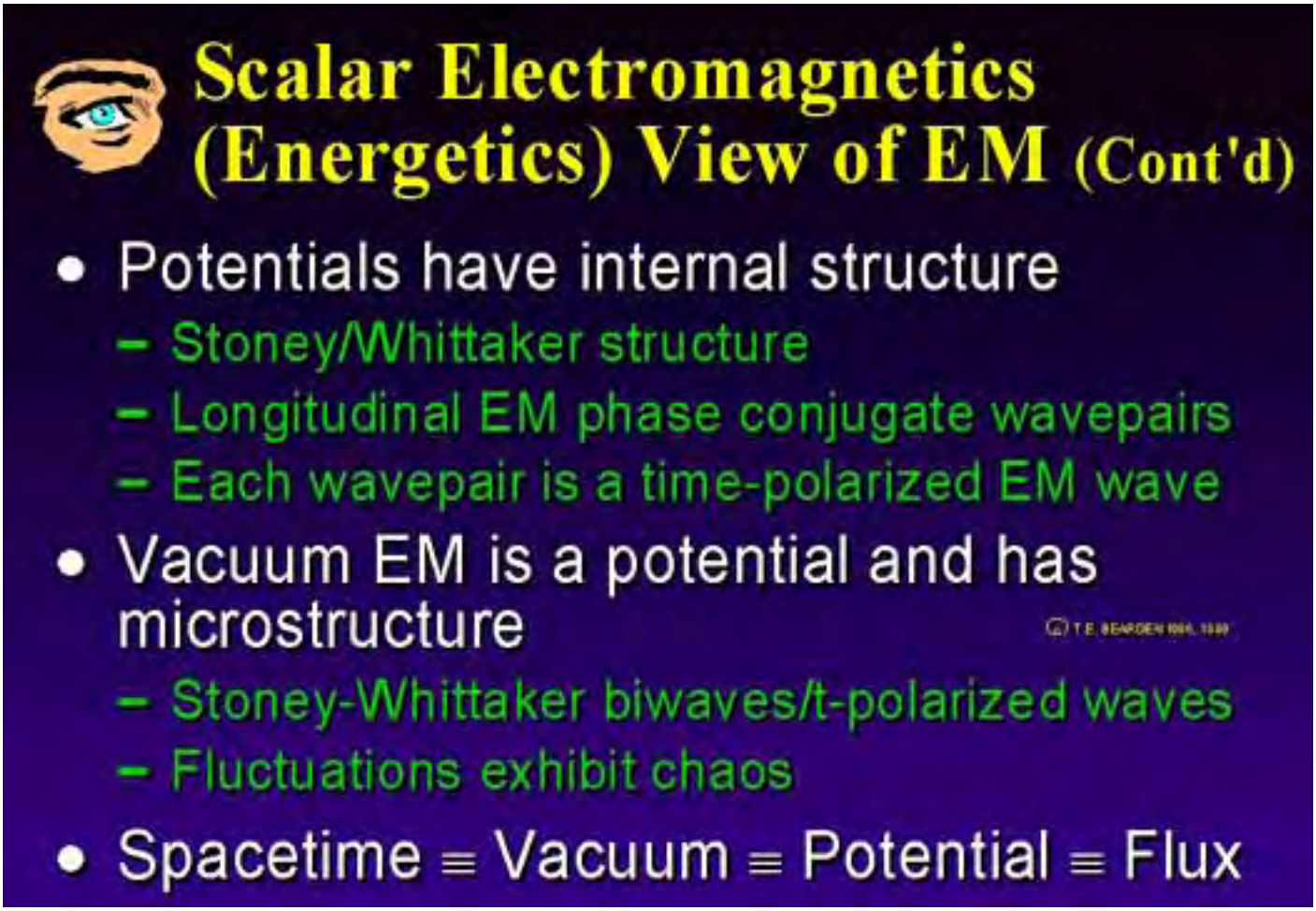
LONGITUDINAL EM WAVE PLUS
PHASE CONJUGATE REPLICA WAVE

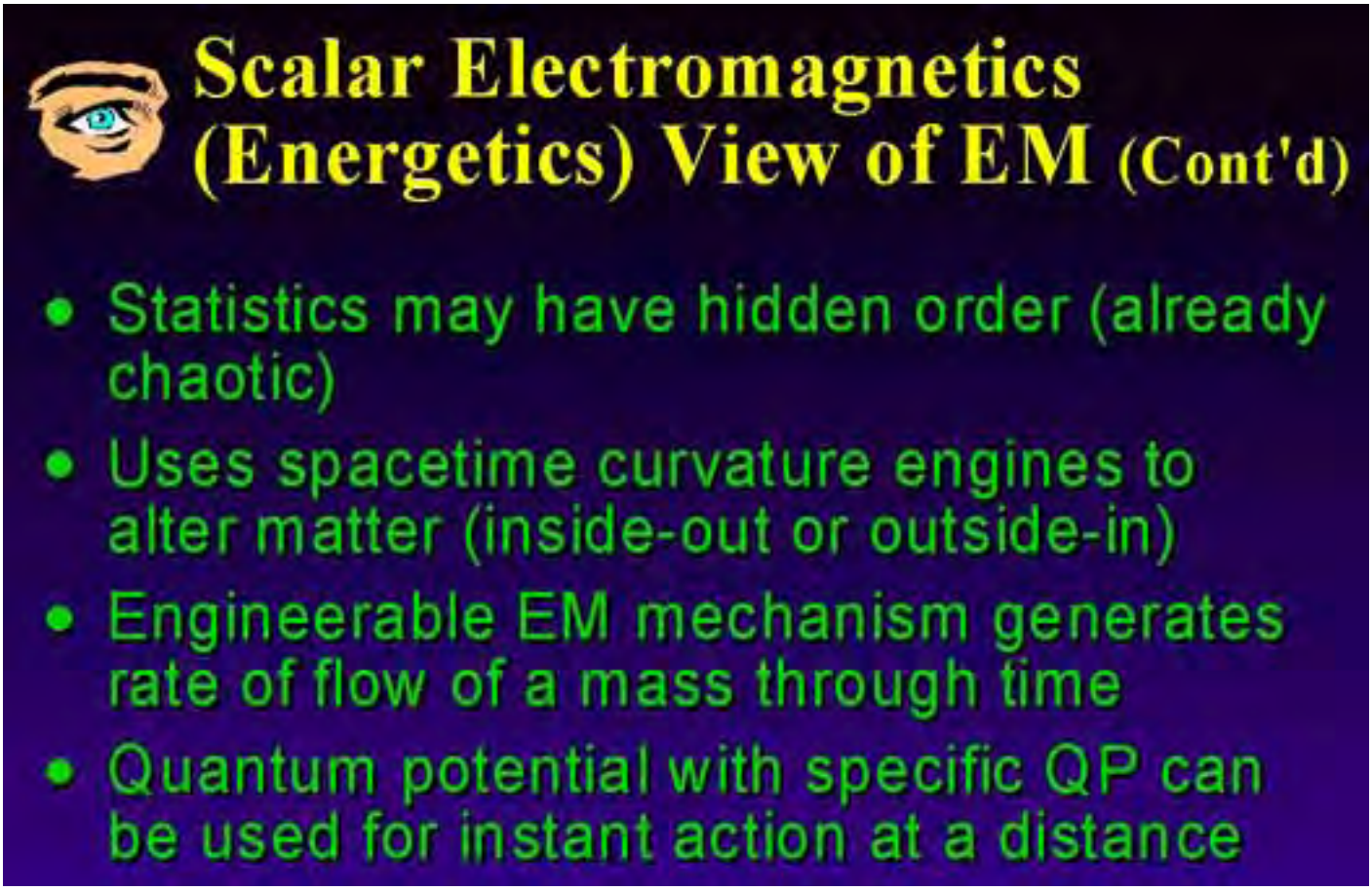


TIME DENSITY WAVE

Oscillates rate of flow of time about some average value

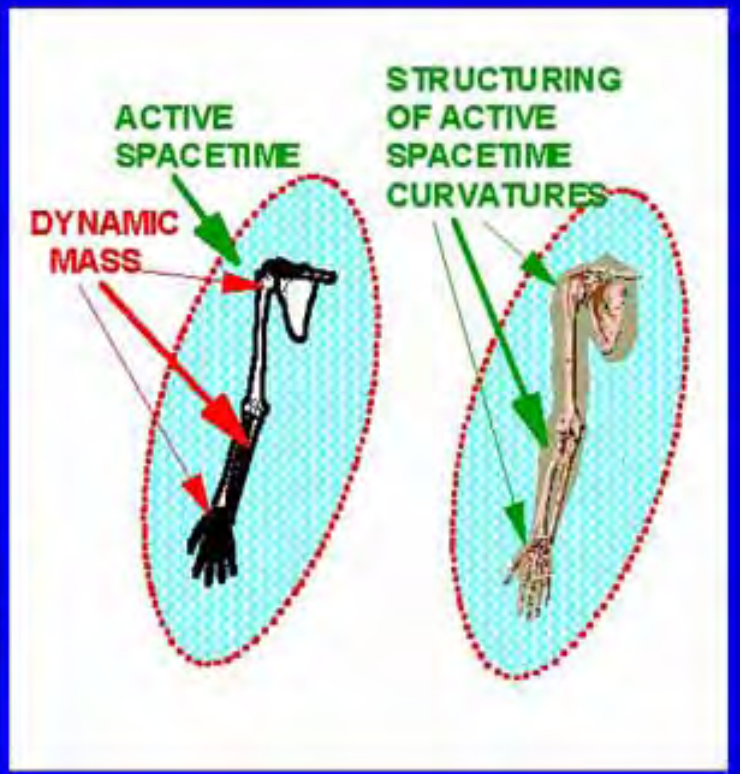

Scalar Electromagnetics
(Energetics) View of EM
• Potentials real; primary causes of EM phenomena
– Force fields made by differentiations of potentials
– Force fields are effects, not primary causes
– Force fields exist only in, on mass particles
• Actions due to potentials and their interference
– Action at a distance or locally
– Quantum potential and hidden variables
• Locally curved spacetime, engineerable by EM
– Gravity effects not necessarily negligible
– Strong EM force or time used as agent of curvature


Scalar Electromagnetics
(Energetics) View of EM (Cont'd)
• Potentials have internal structure
– Stoney/Whittaker structure
– Longitudinal EM phase conjugate wavepairs
– Each wavepair is a time-polarized EM wave
• Vacuum EM is a potential and has microstructure
– Stoney-Whittaker biwaves/t-polarized waves
– Fluctuations exhibit chaos
• Spacetime ≡ Vacuum ≡ Potential ≡ Flux


Scalar Electromagnetics
(Energetics) View of EM (Cont'd)
• Statistics may have hidden order (already chaotic)
• Uses spacetime curvature engines to alter matter (inside-out or outside-in)
• Engineerable EM mechanism generates rate of flow of a mass through time
• Quantum potential with specific QP can be used for instant action at a distance

Extended General Relativity Principle

- "All levels of energy structures and all levels of time structures mold spacetime geometry.
- This is called a *vacuum engine* (spacetime engine).
- Spatial and temporal structuring act upon mass at all levels.
- This produces *templates* of forces, for translations and stresses."

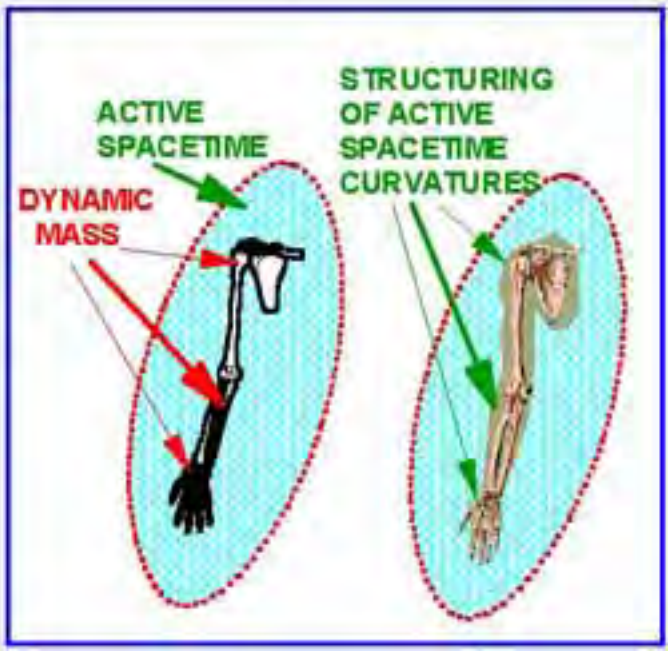


Extension of Work-Energy Theorem

- *Theorem:* $W = k_f - k_i = \Delta k$ [1]
- k must be interpreted not as energy *per se*, but as *collected/collecting* energy.
- The reaction cross section λ for the collecting process must be included.
- *Extension:* $W = \lambda (k_f - k_i) = \lambda \Delta k$ [2]
- Normally $\lambda \leq 1$, as for elastic collision or Stokes emission.
- However, $\lambda > 1$ is now possible, for processes which asymmetrically self-regauge. An example is Letokhov's negative absorption of the medium.
- Working models are the Patterson Power Cell® and Lawandy lasing without population inversion.

MTW's General Relativity Principle

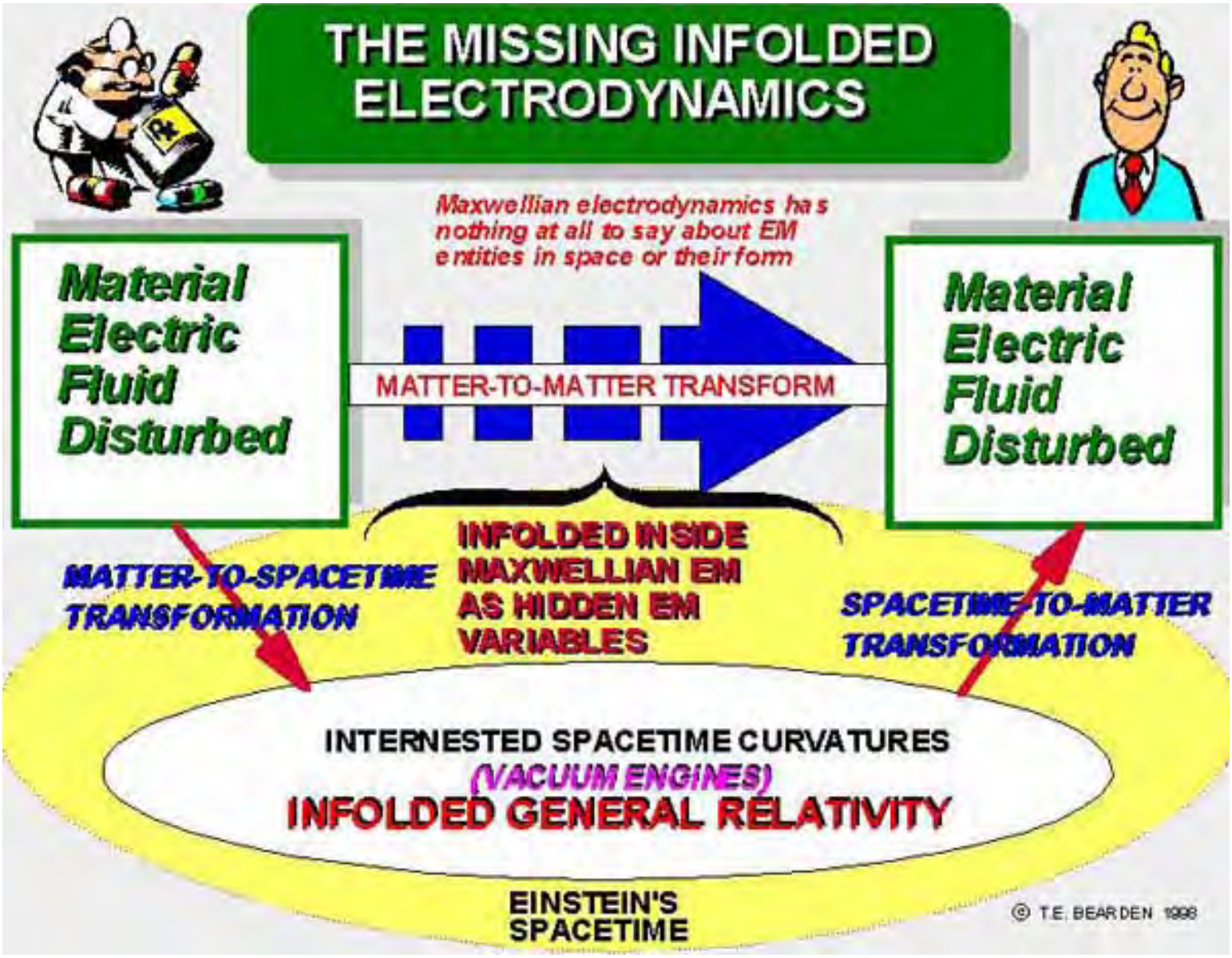
- "Space acts on matter, telling it how to move.
- In turn, matter reacts back on space, telling it how to curve."



Use of General Relativity (GR) in Particle Physics

- GR seldom used in particle physics
- In cold fusion, Matsumoto* has applied general relativity
- Consistent with important cold fusion results
- Used spacetime (ST) curvature by energy density
- Matsumoto did not utilize:
  - Longitudinal EM waves
  - Time density waves
  - Time density curvatures of ST (gain = $9 \times 10_{16}$)

* T. Matsumoto, "Mechanisms of Electro-Nuclear Collapse," Proc. ICCF-7, Vancouver, BC, Canada, Apr 1998, p. 98


THE MISSING INFOLDED ELECTRODYNAMICS
Maxwellian electrodynamics has nothing at all to say about EM entities in space or their form
Material Electric Fluid Disturbed
MATTER-TO-MATTER TRANSFORM
Material Electric Fluid Disturbed
MATTER-TO-SPACETIME TRANSFORMATION
INFOLDED INSIDE MAXWELLIAN EM AS HIDDEN EM VARIABLES
SPACETIME-TO-MATTER TRANSFORMATION
INTERNESTED SPACETIME CURVATURES
(VACUUM ENGINES)
INFOLDED GENERAL RELATIVITY
EINSTEIN'S SPACETIME
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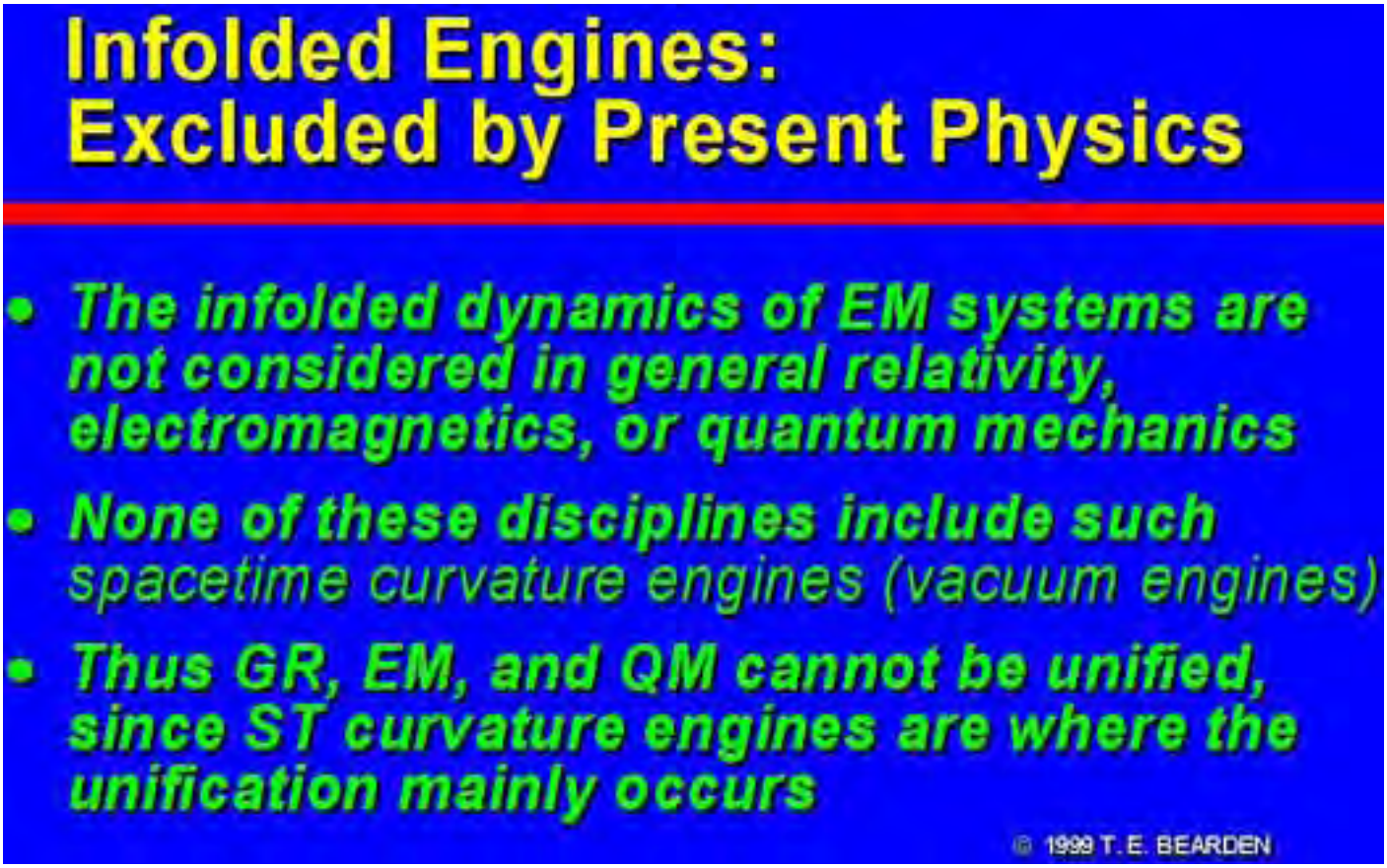
Infolded Engines:
Excluded by Present Physics
• The infolded dynamics of EM systems are not considered in general relativity, electromagnetics, or quantum mechanics
• None of these disciplines include such spacetime curvature engines (vacuum engines)
• Thus GR, EM, and QM cannot be unified, since ST curvature engines are where the unification mainly occurs
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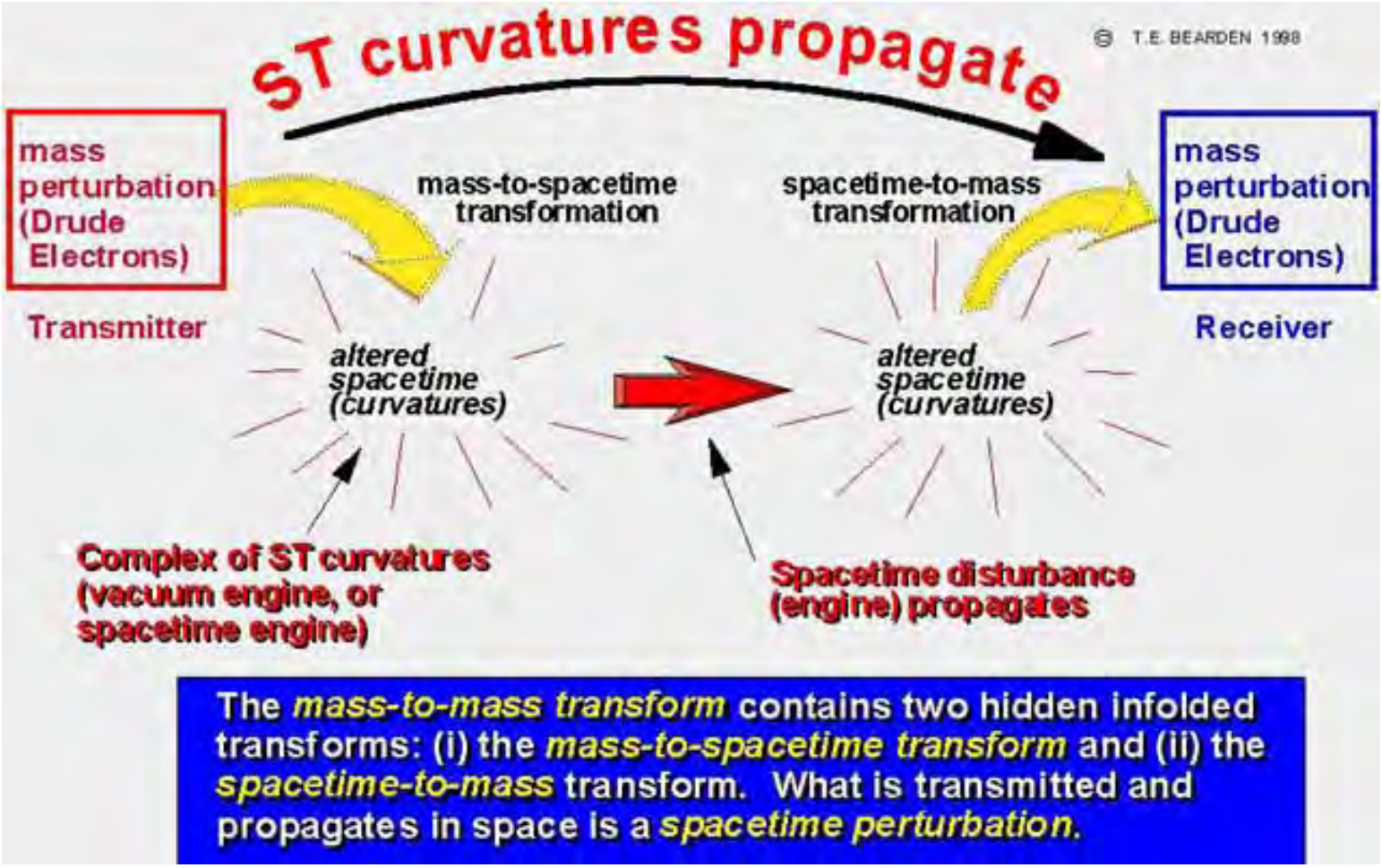
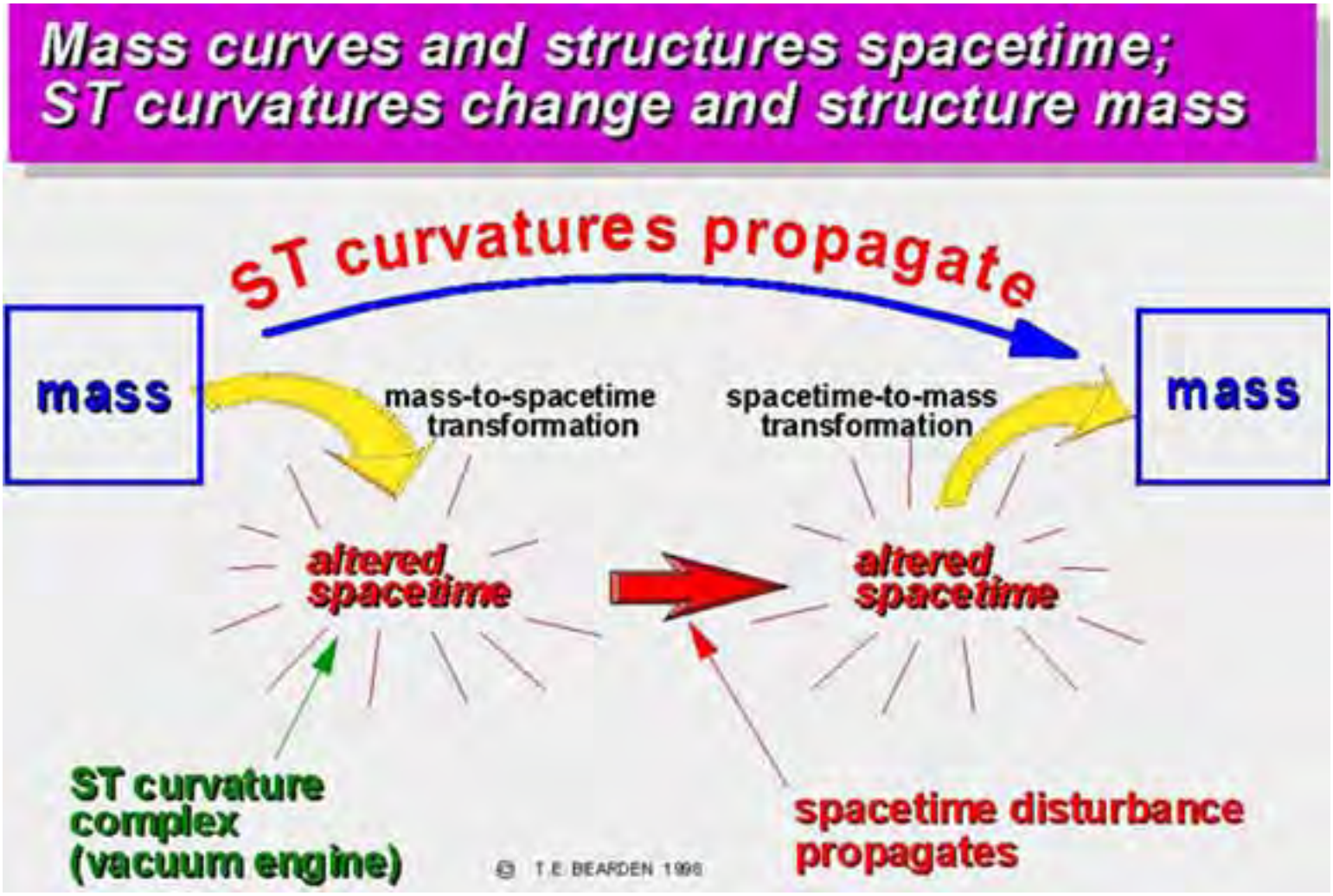

ST curvatures propagate
© T.E. BEARDEN 1998
mass perturbation (Drude Electrons)
Transmitter
mass-to-spacetime transformation
spacetime-to-mass transformation
mass perturbation (Drude Electrons)
Receiver
altered spacetime (curvatures)
altered spacetime (curvatures)
Complex of ST curvatures (vacuum engine, or spacetime engine)
Spacetime disturbance (engine) propagates
The mass-to-mass transform contains two hidden infolded transforms: (i) the mass-to-spacetime transform and (ii) the spacetime-to-mass transform. What is transmitted and propagates in space is a spacetime perturbation.


Mass curves and structures spacetime;
ST curvatures change and structure mass
ST curvatures propagate
mass
mass-to-spacetime transformation
spacetime-to-mass transformation
mass
altered spacetime
altered spacetime
ST curvature complex (vacuum engine)
spacetime disturbance propagates
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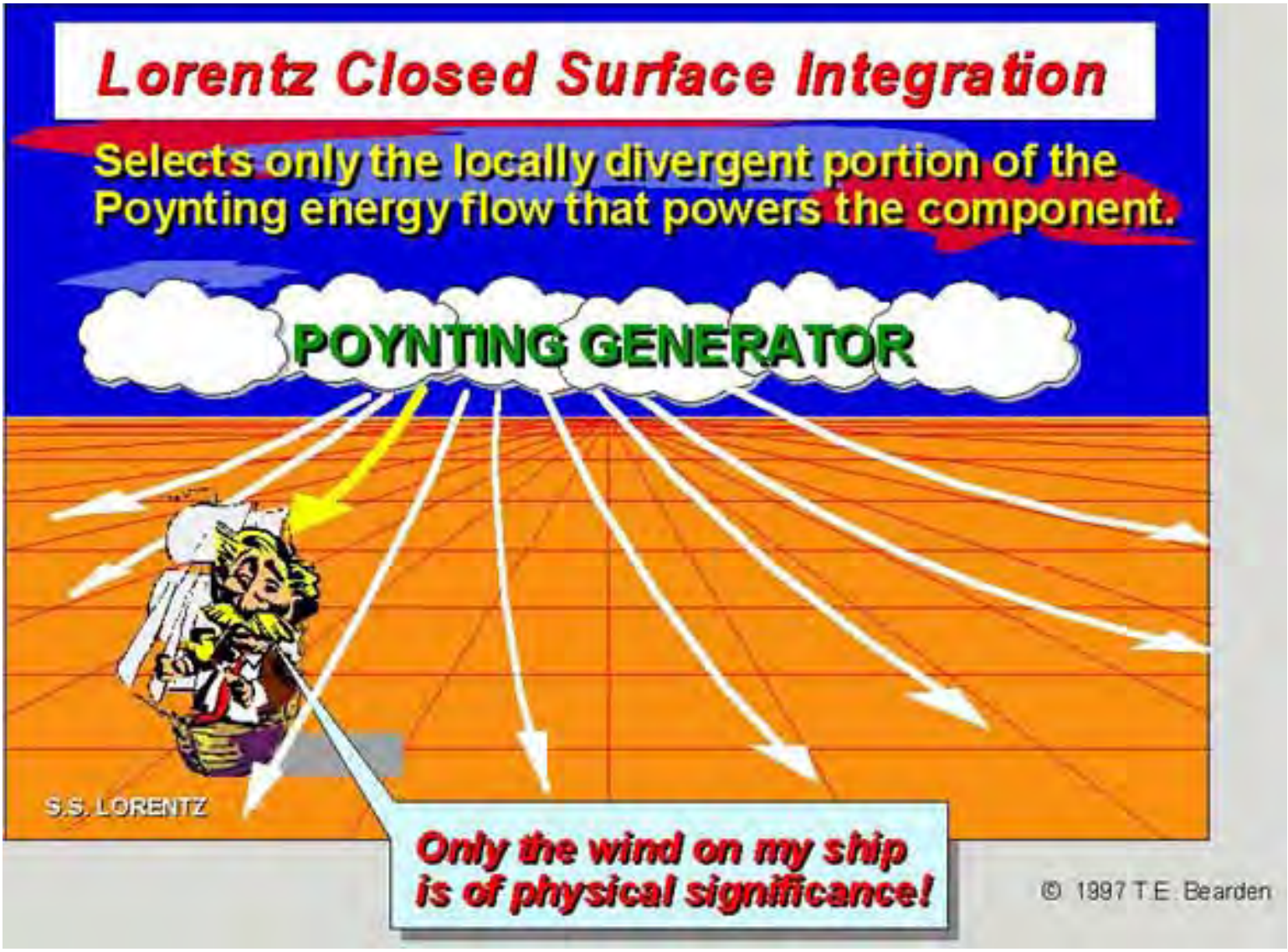
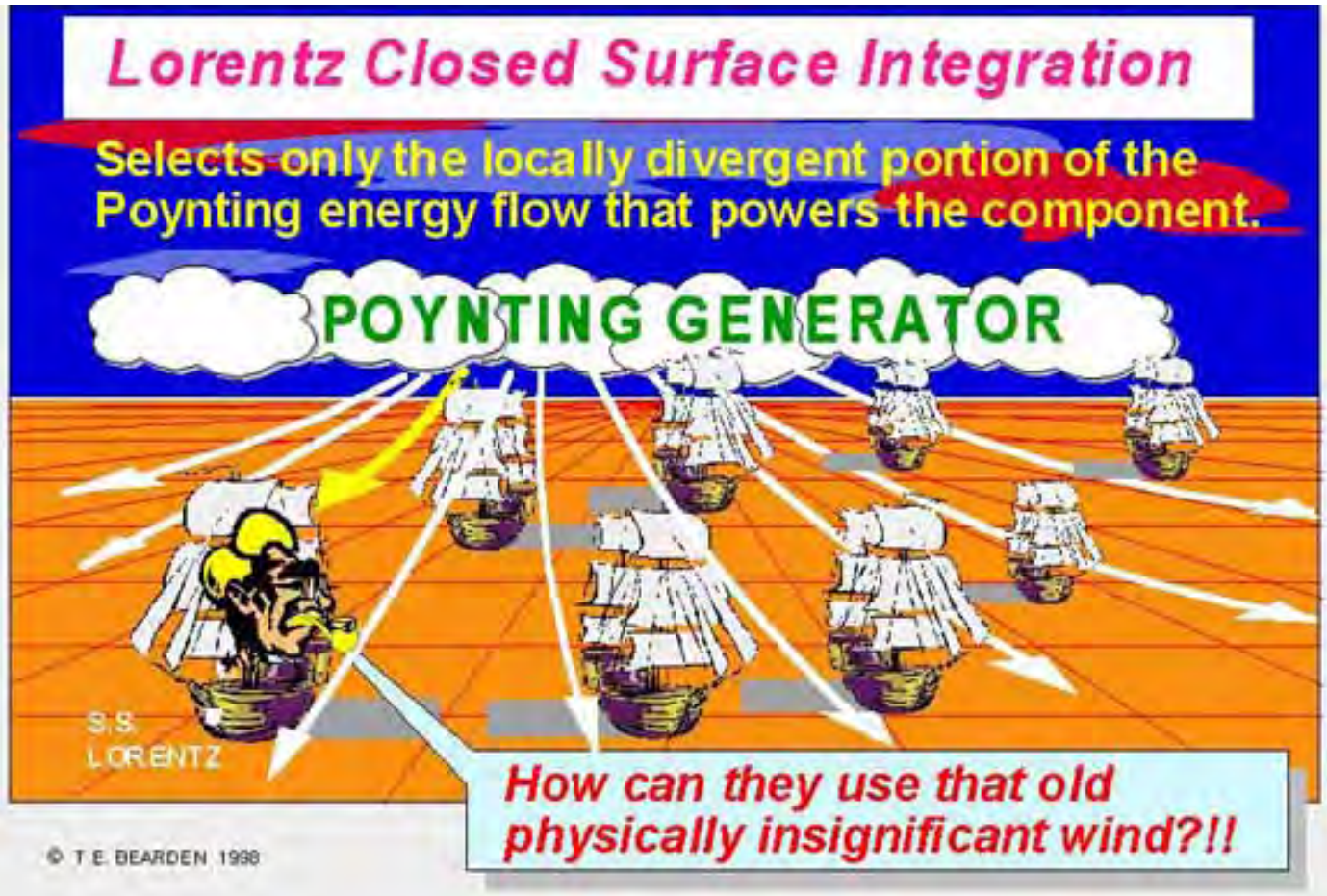
At Infinite Velocity:
Each Is Every Other
SPACETIME
VIRTUAL PARTICLE FLUX
POTENTIAL
MIND AND MIND LEVELS
MASS
PLANET
LIVING ORGANISMS
© 1997 T.E. Bearden

Lisitsyn's Report: Brain Code Broken

- **THEORY DEVELOPED AND FITTED**
- **HYSTERESIS MEMORY LOOP**
- **CONTROLLED EM INDUCTION**
  - IMAGES
  - SENSATIONS
  - PREDETERMINED EMERGENCE
- **23 EEG BANDS**
  - UP TO 8.1 X 10^{20} HZ
  - 11 INDEPENDENT CHANNELS

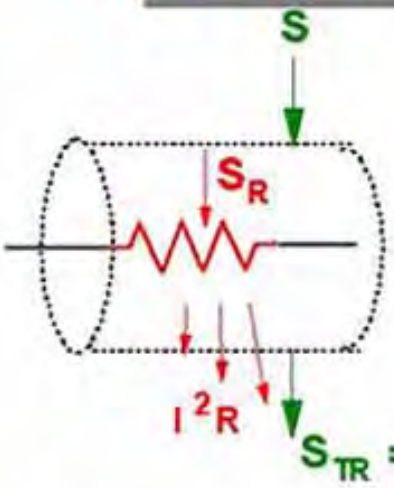
S.K. Lisitsyn, "New Approach to the Analysis of Electroencephalograms," DDC Report AD73005, p. 16-25.


Lorentz Closed Surface Integration
Selects only the locally divergent portion of the Poynting energy flow that powers the component.
POYNTING GENERATOR
S.S. LORENTZ
Only the wind on my ship is of physical significance!
© 1997 T.E. Bearden

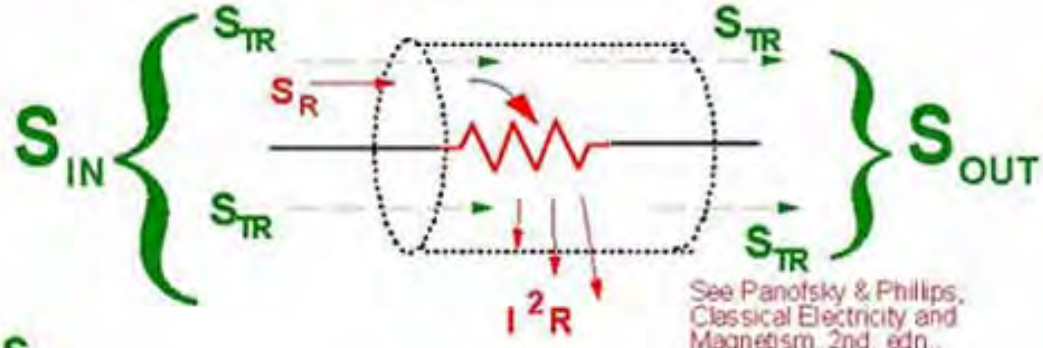


Lorentz's physically insignificant energy flow can be collected and utilized.

Lorentz surface integration of the Poynting vector around a closed surface



1a. Lorentz surface integration.



See Panofsky & Phillips, Classical Electricity and Magnetism, 2nd. edn., Addison Wesley, 1962, p. 178-181.

1b. Actual S in and S out.

Note: If the S-vector is integrated over the closed surface, then all energy *transport* passage is zeroed, leaving only the very small component of the input S-flow that is powering the joule heating of the resistor. In short, only the small component of the S-flow that is equal in magnitude to the Slepian vector $j\phi$ remains. This measures only the tiny portion of the S-flow that is "collecting" on electrons passing through the resistor, and therefrom being dissipated out of the resistor as joule heating. It discards everything else (all S_{TR}'s and S_{OUT}). S_{IN} becomes S_R.

Longitudinal EM Photon Interaction with Charge

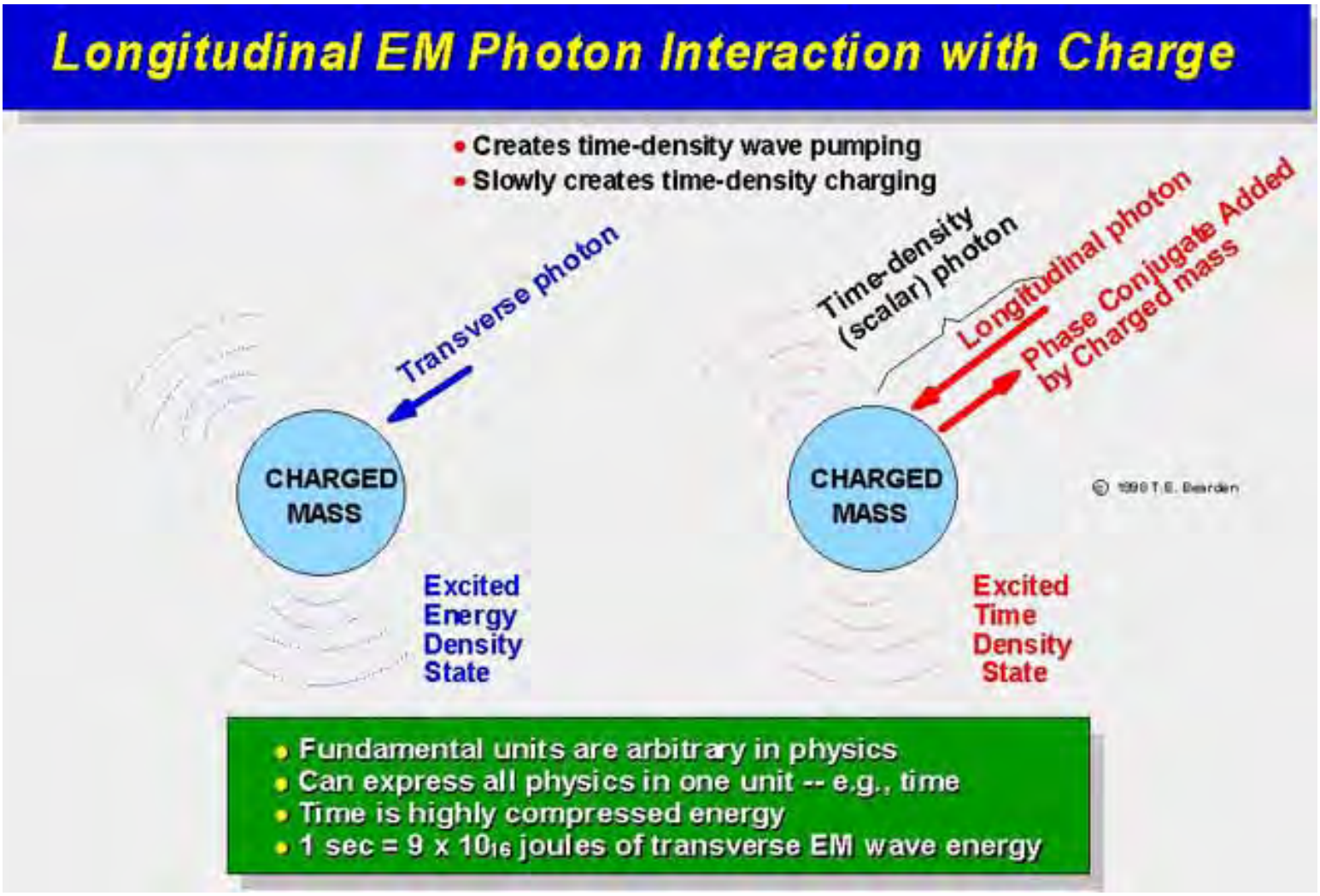
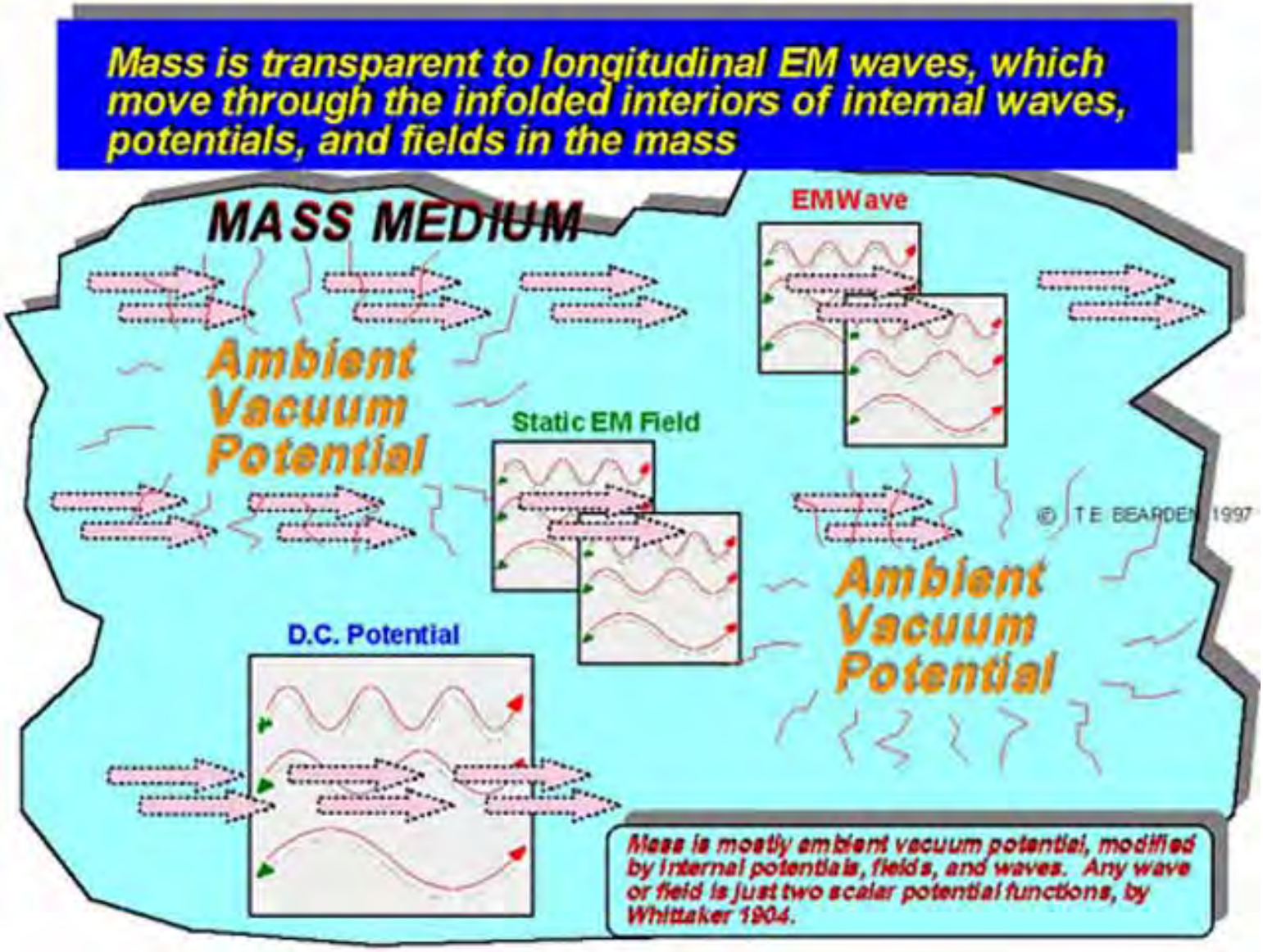
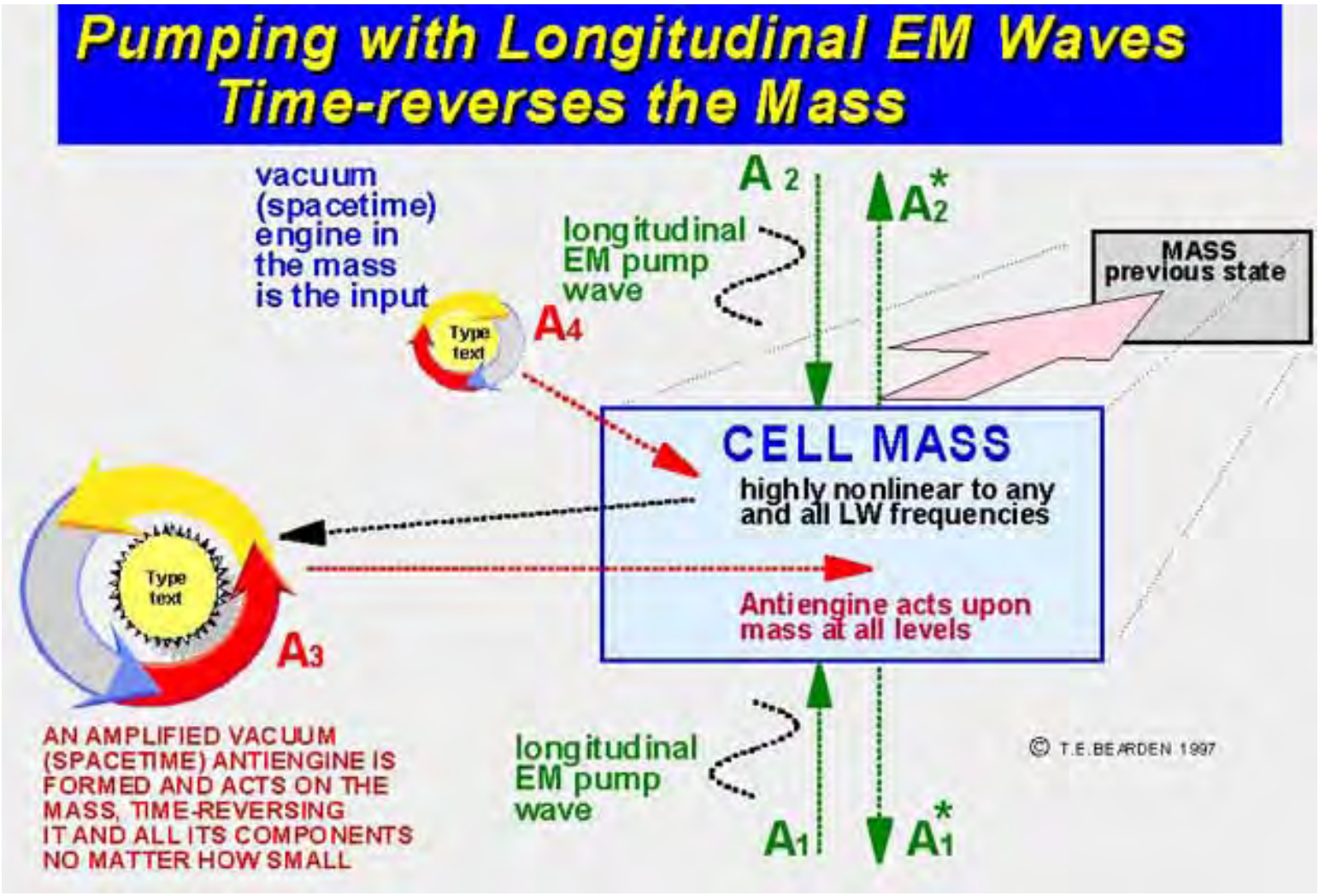


Figure 1-8. Infolded biwave composition of a scalar potential.




Pumping with Longitudinal EM Waves
Time-reverses the Mass
vacuum (spacetime) engine in the mass is the input
A 2
A2*
longitudinal EM pump wave
MASS previous state
Type text
A4
CELL MASS
highly nonlinear to any and all LW frequencies
Type text
A3
Antiengine acts upon mass at all levels
AN AMPLIFIED VACUUM (SPACETIME) ANTIENGINE IS FORMED AND ACTS ON THE MASS, TIME-REVERSING IT AND ALL ITS COMPONENTS NO MATTER HOW SMALL
longitudinal EM pump wave
A1
A1*
© T.E.BEARDEN 1997

Maxwell's Quaternion Theory

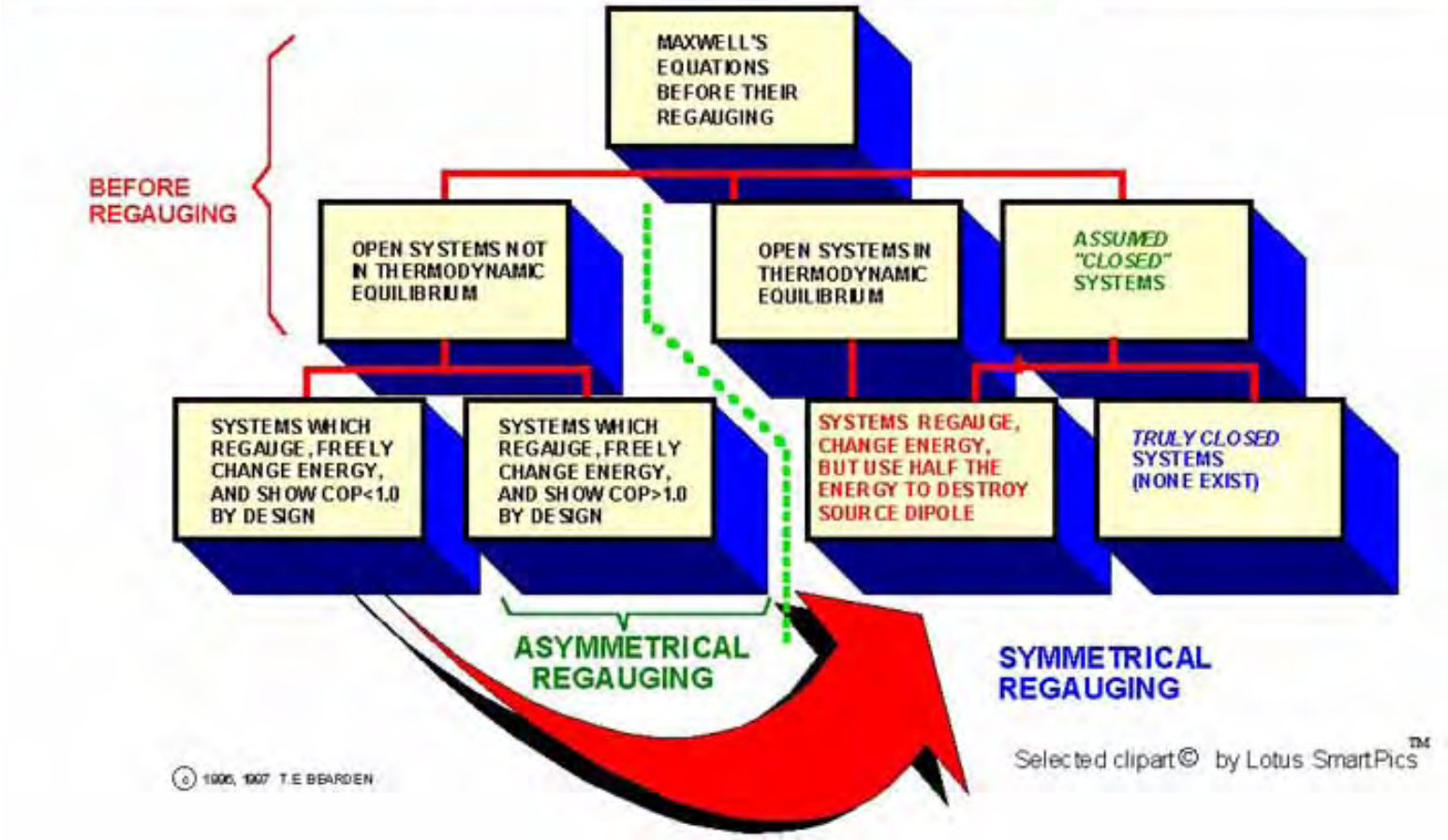
- Quaternions:
  - Discovered by Hamilton in 1843
  - A quaternion has a vector part
  - A quaternion has a scalar part
  - First significant non-arithmetic number system
  - Higher topology than vector or tensor algebra

- Maxwell's theory was in quaternion equations
  - 20 equations in 20 unknowns
  - Reduced to a small 4-equation subset by Heaviside and Gibbs
  - EM topology dramatically reduced

Maxwellian Systems

Before regauging, after symmetrical regauging, and after asymmetrical regauging

Note: Any system must first break equilibrium in its vacuum exchange, before it can energize Drude electrons and "power" the load. Asymmetric regauging is always utilized. Powering loads and losses is a symmetry-restoring operation.



Maxwell's four equations reduce to:

$$\nabla^2 \Phi + \frac{1}{c}\frac{\partial}{\partial}(\nabla \bullet A) = -4\pi\rho \qquad [1]$$

$$\nabla^2 A - \frac{1}{c^2}\frac{\partial^2 A}{\partial t^2} - \nabla(\nabla \bullet A + \frac{1}{c}\frac{\partial \Phi}{\partial t}) = -\frac{4p}{c} J \qquad [2]$$

A is replaced by A', where

$$A' = A + \nabla\Lambda \qquad [3]$$

The new B' field then becomes

$$B' = \nabla \times (A + \nabla\Lambda) = \nabla \times A + 0 = \nabla \times A = B \qquad [4]$$

A new E-field will also be formed. So let

$$\Phi' = \Phi - \frac{1}{c}\frac{\partial \Lambda}{\partial t} \qquad [5]$$

Per Jackson, (A,Φ) are *habitually* chosen so that

$$\nabla \bullet A + \frac{1}{c}\frac{\partial \Phi}{\partial t} = 0 \qquad [6]$$

The *net symmetrical* regauging separates variables.

Two inhomogeneous wave equations result:

$$\nabla^2 \Phi - \frac{1}{c^2}\frac{\partial^2 \Phi}{\partial t^2} = -4\pi\rho \qquad [7]$$

$$\nabla^2 A - \frac{1}{c^2}\frac{\partial^2 A}{\partial t^2} = -\frac{4\pi}{c} J \qquad [8]$$

Equations [1] and [2] *arbitrarily* changed to [7] and [8]