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**Book Review****Energy from the Vacuum  
Concepts and Principles**

by Thomas E. Bearden

Cheniere Press, Santa Barbara, CA, 93109

reviewed by Hal Fox, Editor, Journal of New Energy

This remarkable book with its descriptions of many over-unity devices is expected to become a bible of new-energy information for a new generation of energy scientists and developers. Bearden's life's work of investigating the sources of and the control of space energy is detailed in the eleven chapters of this important volume. Every person who is involved in, searching for, or developing energy sources should have this book to study and retain as a reference.

An important aspect of Bearden presentation is that even though there is no method by which one can get more energy out than energy that is put into a device, there is an enormous reservoir of energy in space all around us that can be tapped under proper circumstances. This gives rise to the important distinction between a system's coefficient of performance (COP) and its overall efficiency. While the COP can exceed 1.0 because it compares output energy with only the operator-input energy, the overall efficiency can never exceed unity because one must take into account all of the energy input to the system, even if it comes from tapping the abundant space energy. However, Bearden contends that most electrodynamicists have assumed away COP > 1 systems.

A major cornerstone of the book is the concept that energy can be extracted from locally curved spacetime and that virtual photon energy can be extracted from the vacuum. Perhaps the most important concept to be mas-

tered from this book (and to be put into practice in system development) is the coupling between time and available energy. There is considerable emphasis on the concept that describing an energy-producing unit using three-space coordinate system omits the most important aspect of energy generation. In Bearden's analysis, no energy device can produce power unless it is effectively moving through time. Bearden conclusively demonstrates that it is the time-coupled energy that is an exceedingly important aspect of the development of useful energy by tapping the energy of spacetime. The reader may be challenged with the constructive criticism of the reality of the long-taught 3-coordinate system to represent the reality of the concepts of physics. However, by the end of this important book, the diligent reader will be viewing the world of physical phenomena in a more complete 4-space frame of reference.

In Bearden's view, "... all EM devices are already powered ... by EM freely extracted from the seething vacuum..." (p. 584), and the proof of this "has been in particle physics for 45 years, since the award of the Nobel Prize to Lee and Yang in 1957..." (p. 173). Furthermore, as he proposes on p. 606, "The question as to whether COP > 1.0 electrical power systems are possible and practical must be resolved by direct experiment, and not by established models and cherished concepts that already arbitrarily exclude such systems!" Indeed, he wastes no time in introducing his rev-

olutionary concepts, as he states even in the introduction that "Every battery and generator already extracts a non-diverged energy flow from the vacuum (and provides as output) than the Poynting diverged energy flow theory accounts for..." (p. xxi). In his view, electrical energy is "... extracted and transduced from the active vacuum by the broken symmetry of the opposite charges on the ends of the source dipole ..." (p. xxii). In the Bearden model, electrical charges are actually dipoles, where each dipole consists of one real charge and an opposite polarity virtual charge.

Comparing our power plants to windmills that are put into closed barns so that the environmental wind cannot turn them, Bearden states that the closed circuit destroys the source dipoles and their broken symmetry by forcing the Lorentz symmetrical re-gauging condition. It destroys the dipoles faster than it powers the load, thereby always yielding a COP < 1. Thus, as the dipoles are killed, so too is the mechanism for extracting electromagnetic energy from the vacuum. As Bearden states more succinctly, "... we pay the power company to hold a giant wrestling match inside its generators and lose!"

The book includes a comprehensive discussion of gauge theory. Beginning with a discussion of symmetrical re-gauging (which changes the scalar and vector potentials but leaves the electric and magnetic fields invariant, thereby simplifying both the theory and the

calculations), Bearden notes that asymmetric re-gauging will change the total potential energy of a system so as to create net excess forces. A system designer can control where and when these excess forces manifest by controlling the re-gauging.

*Energy from the Vacuum* presents a historical development of classical electromagnetic theory and includes the marginalization of the quaternion formulation. In addition, Bearden discusses the quantum potential (which "appears instantly"), the Aharonov-Bohm effect, Riemann geometry, Mach's principle, general relativity, Kaluza-Klein theories, the Sachs unified field extension of Einstein's theory, and O(3) group symmetry electromagnetism in the context of usable vacuum energy. Even the Whittaker decomposition of electromagnetic fields is re-interpreted in terms of a longitudinal wave in the time domain, possibly correlated with an emitted longitudinal electromagnetic wave in 3-space.

Some of Bearden's concepts and interpretations are radical by mainstream scientific standards. As early as the forward, he proposes that the first law of thermodynamics be extended and states that the second law is only an approximation when conditions are appropriate - and this follows his contention that "Every charge in the universe already freely and continuously pours out electromagnetic energy in 3-space in all directions, without any observable electromagnetic input..." (p. xx). Emphasizing that thermodynamics assumes forward-flowing time, Bearden discusses the time reversal of Coulomb forces, in which like charges attract and unlike charges repel! In his view, a charged particle has different dimensionality before vs. after observation - a fact that some readers will not

readily grasp. After presenting his case for a Heaviside "dark energy" flow component that often exceeds the Poynting component by orders of magnitude, he proposes that this "dark energy," which accompanies all interactions between electromagnetic fields and charges, is responsible for the excess gravity observed to be holding the spiral arms of distant galaxies intact! Perhaps a more immediate concern is the possible causal relationship between field-free regions having high potentials and the anomalous adverse health changes that have been observed in such regions. If a causal relationship exists, it corroborates the large-scale physical and biological significance of the electric and/or magnetic potentials and the vacuum energies.

A compelling argument for developing alternative energy sources is pervasive throughout the book. For example, on p. 169, Bearden states, "We believe that a transfer of much of the 'electricity from oil' to 'electricity from vacuum' can be quickly accomplished, if the government and the scientific community can be induced to move with full priority and vigor in the direction indicated in this book. However, to get that done, it apparently will be done over the writhing bodies of our leading scientific organizations, literally dragging the organizations to face the proven fact of giant negentropy of every charge and dipole in the universe over their strenuous objections." Echoing the thought on pp. 290-291, he writes, "To keep from destroying the world economy and the biosphere, it is absolutely essential that COP>1.0 electrical power systems - including self-powering systems taking their input energy from the seething local vacuum - be developed to produce the necessary electrical

energy needs of the world, cheaply, cleanly, and easily. If one or more readers should succeed in developing and producing such systems, then the entire purpose of this book will have been fulfilled." Again on p. 607 (the final paragraph of chapter 11), "A thorough review and corrections of the foundations of EM theory is required for the survival of this nation and much of civilization. It is also required for the cleanup of the increasing polluted biosphere, survival of the threatened species of the Earth, reduction of present global warming trends, and the survival of this fragile and beautiful planet itself."

The number of references and citations (752) collected, studied, and cited by Bearden attests to his thoroughness and commitment. It discusses many means by which others have developed concepts, ranging from ideas to working models, that could lead to commercial new energy systems - ranging from Tesla's single wave circuit and T. Henry Moray's radiant energy device to ideas that are more contemporary. Some of these devices have been suppressed, others are still being developed. However, none of these many potentially important devices have, as yet, been commercialized. In the judgment of this reviewer, that process is soon to change. There now appears to be less intense resistance to new-energy devices and systems.

This book is an excellent guide to further research and development in the generation and harnessing of energy, and it is a must read for all who have an interest in changing the way the world produces and distributes energy. For those who are working with new-energy devices and systems, this book is the most comprehensive reference