

College of Pharmacy, where the major effort was on synthesis of potential anti-cancer drugs under contract with the National Cancer Institute (NCI). I also wrote the chapter on Cancer Chemotherapy in the 2nd and 3rd editions of W. O. Foye, Ed., *Principles of Medicinal Chemistry*; this also appeared as Kauffman, J. M., & Foye, W. O. (1979). The nature and treatment of cancer. *The Apothecary*, 91, May/June 7; and Kauffman, J. M., & Foye, W. O. (1979). Antineoplastic drugs. *The Apothecary*, 91, July/August 7. Later I served as consultant to the Franklin Research Center in Philadelphia, PA, partially in connection with their contract with the NCI to develop anticancer drugs.

Science and Human Transformation by William A. Tiller, PhD. Walnut Creek, California: Pavior Publishing, 1997. 299 pp.

Science and Human Transformation is largely a compilation of the last 30 years of research of Dr. Tiller. It contains an enormous variety of interesting material touching on aspects of subtle energy from qigong to homeopathy to auras. He not only provides a great number of theoretical descriptions of how these phenomena fit together in the conventional scientific framework, but also includes a significant amount of experimental results to support his theories. His book aims to take a leap forward in defining a new paradigm of how these phenomena operate, and it appears to have done just that.

He starts out discussing the inadequacy of the current scientific paradigm in explaining subtle energy phenomena, discussing electromagnetic radiation as a mechanism for the interaction of the human body with subtle energies. He then goes on to describe a device to measure human intention using a gas discharge system, providing both a great amount of detail regarding how the device is constructed as well as experimental results. Dr. Tiller goes on to develop a theoretical model for how subtle energies interact with electromagnetic fields through the magnetic vector potential. If this sounds complicated, it's because it is. As is characteristic of the book, about 80% of the material can be consumed by a reader with a small or intermediate amount of physics background, but the other 20% requires a fair amount of graduate study to fully understand.

The author goes on to give an introduction to conventional Grand Unified Theory, a section that is more easily understood if the reader has a good base in physics. He then derives and explains his own version of such a theory—what he calls his “Level One” theory. This theory describes a 10-dimensional reality that contains our 3-dimensional world and describes how the different N-dimensional planes interact with each other, using the notion of a hologram as a basis. Dr. Tiller includes the etheric, mental and astral planes, as discussed in many different philosophies, and posits the existence of magnetic monopoles and a new particle, the deltron, as the particle that interacts with the physical plane and the other dimensions. The author goes on to show how

this theory could explain remote viewing, teleportation, firewalking, homeopathy, and feng shui, and he still manages to tie it back to modern cosmology theory. It's a very detailed and complete theory, but it's not always clear where he pulls some of his constants, such as the nodal spacing of this 10-d space. It's at this point the reader can tell Dr. Tiller's background is in Material Science, as this, as well as quantum mechanics, is heavily involved in this section. A strong physics background (preferably at the graduate level) will help the reader understand this section.

In the next section, Dr. Tiller describes electromagnetism and antenna theory as a basis for how the human body can interact with subtle energy through electromagnetic energy detected with the use of acupuncture points and chakras. He spends a lot of time describing electromagnetism and antenna basics and consequently this is one of the easier to understand sections. One of the more interesting parts of this section is where he proposes the notion of auras as existing as the "near field" of the collection of antennas that constitutes our cells and bodies as a whole. He goes on to describe how our body can detect light through a mechanism beyond acupuncture points. The author then describes how information received by the body at the unconscious level controls involuntary muscular activity, such as in dowsing, based on the material being used to dowse. Dr. Tiller outlines other research he has done in this area, including experimental devices based on Eeman's Relaxation Circuit, that could help balance one's energy. Unfortunately he doesn't provide any data to further support this theory.

Finally the author discusses communication theory as a basis to show the need for humanity to realize the interconnectedness between us and the world at large. He focuses on man's relationship to the cosmos, self, and society through examples taken from electromagnetism, such as phase coherence and constructive/destructive interference. Dr. Tiller closes by deriving a "distribution of consciousness" and discusses how human evolution could be characterized by the extent of penetration of spirit into dense matter.

There aren't many things in this book that stood out as needing improvement. The primary problem this reviewer had was that the author would go from a basic description of spirituality and philosophy right into graduate level physics, sometimes without warning. In some cases only a basic physics and mathematical background is needed to understand the point he is trying to get across, but a bit of warning (and perhaps some basic theory located in an appendix) would be helpful before diving into tensor mathematics and quantum electrodynamics. Dr. Tiller also attempts to include almost every possible subtle energy phenomena in his theoretical model. This is quite an achievement but perhaps he didn't need to cast his net quite so wide. Finally, the author occasionally refers to Theosophical and Soviet research in support of his model, the veracity of which is perhaps somewhat suspect.

In conclusion, this book is highly recommended to anyone who is looking for a subtle energy book with a good scientific and mathematical basis, and is

required reading for anyone seriously involved in the field. There's a lot of excellent research described in this text that warrants further study. This reviewer has never seen as much raw physics derivation applied to as many subtle energy topics in such detail. This alone is reason enough to buy this book. As for the casual reader, although much of the physics and math is a bit deep at times, that shouldn't scare you off. There's still a great deal of easily consumable material that you won't find anywhere else.

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FURTHER BOOKS OF NOTE

Beyond Science by John Polkinghorne. New York: Cambridge University Press, 1998. 131 pp., \$11.95, paper. ISBN 0-521-62508-4. (1996 cloth ed. is out of print.)

John Polkinghorne is a physicist and an Anglican priest who has thought and written much about the relation between science and religion. (An earlier book, *The Faith of a Physicist* was reviewed in *JSE*, 9, 428–430.) The present volume is based on a series of lectures and is a delightfully readable and concise essay about how science fits into the larger context of human life.

The chapter headings describe the contents well enough: “Is science enough?”; “Understanding the physical world”; “Working together” (the communal aspect of scientific activity); “Memoirs of the great”, with interesting sketches of Dirac, Salam, Gell-Mann, Feynman, Hawking; “What happened to the human mind?”—as science concentrated on material matters; “What does it mean?”; “Ultimate questions”; “Is, ought and wonder”; “Responsible behaviour”.

Though focusing on matters “beyond science”, along the way Polkinghorne gives a fine account of what science is and how it works. The vagaries of mainstream acceptance or rejection are illustrated, for instance, by the Weinberg-Salam “electroweak theory” that eventually gained them a Nobel Prize: the theory was at first ignored, not referred to in the literature for three years after it was first proposed in the late 1960s (pp. 27–28).

Polkinghorne's observations are on the mark; and often witty as well:

The side-effects of a Nobel award . . . [include that the winners are] granted by society a licence to receive a respectful hearing on topics lying far outside their acknowledged expertise. A few have chosen to take extensive advantage of this opportunity, (p. 31).