BOOK REVIEW

Scientific Qigong Exploration: The Wonders and Mysteries of Qi by Lu, Zuyin. Malvern, Pennsylvania: Amber Leaf Press. 1997. 404 pp. cloth. ISBN 0965-7135-71

This is one of the few books available in English that has tried to explore the scientific essence of qigong -- one of the most promising energy-based health practices, which has been developed in China over the course of several millennium. The author was a renowned professor of nuclear physics at the Institute of High Energy Physics, Chinese Academy of Science (the highest academic institute of science in China) as well as a physics professor at Tsinghua University (the Chinese equivalent of MIT). Prof. Lu was responsible for the comprehensive planning of nuclear physics parameter measurements and radioactive chemistry analytical sampling during China's nuclear tests, and he led the effort of measuring the forces, neutron fields, and gamma fields of atomic bombs in China. It was only during the last ten years of his life that he became involved in the serious scientific study of qigong. Although Prof. Lu finished the manuscript in 1990, it was first published in Chinese in 1995, three years after the author died.

The book was translated into English by two very knowledgeable Ph.Ds who must have had some experience of qigong as well, since some qigong terms are extremely difficult translating but they did a pretty good job. There are a total of 11 chapters plus 4 appendixes. The first two chapters describe the history of qigong research up to 1982. The central part of the book, chapter three through eight, describe the author's collaborations with Dr. Yan Xin, a renowned modern qigong master, in a series of qigong experiments, mostly with the traditional basic-science method, instead of the methods of modern biomedical study. Chapters nine and ten summarize the current understanding of the nature and characteristics of external qi and chapter eleven offers some theoretical assumptions on the nature of external qi by various physicists. It should be a pleasure to read through, especially for those who have some background in PSI research.

What is qigong? Qigong (pronounced as chee kung) is a general term that is applied to a wide variety of traditional Chinese energy exercises and therapies. Currently, there is no consistent definition of qigong in academia; however, qigong is generally considered "a self-training method or process through qi (vital energy) and yi (consciousness or intention) cultivation to achieve the optimal state of both body and mind" (Lin 1997). Traditional Chinese Medicine (TCM) posits the existence of a vital energy (qi) circulating throughout the entire human body. When strengthened or balanced, it can improve health and ward off or slow the progress of disease. TCM considers sickness or pain to be a result of qi blockage and/or unbalanced qi in the body. All TCM therapies -- herbs, acupuncture, massage, diet and qigong -- are based on this philosophy and perspective. External qigong therapy (EQT) refers to the process by which a well-trained qigong practitioner directs his intention or qi energy to help others break qi blockages or to rebalance the qi energy flow in their body so as to alleviate pain and/or abate or eliminate the disease they are experiencing. Exploratory studies of external qi (EQ) refer to research whose focus is on either verifying the existence or examining the latent mechanisms of EQ. In general, the initiation of exploratory studies of the EQ phenomenon of qigong practice was the product of a specific historical period in China.

In order to truly understand this book, it must be considered in light of the historical context that forms the often-unseen background that has influenced certain kinds of research in China. By the end of the 1970s, China finally woke up from the nightmare of the Cultural Revolution (1966-1976). During this period qigong was considered "pseudo-science" or "idealism" and was a forbidden practice in China. Starting around 1978, many scientists and practitioners with vision and insight hoped to rebuild qigong as one of many effective healing methods in health care, and they tried to use scientific measurements and technology to prove that qigong is not "idealism" or purely the effect of psychological suggestions, but rather, some objective life phenomenon and measurable process. Therefore, most of the early studies of qigong focused on verifying the existence of EQ energy.

Nonetheless, scientific exploration of qigong has never become a research focus or specialty in China. Most scientists involved in qigong research have either benefited directly from qigong therapy or started out as nonbelievers who considered this a nonscientific phenomenon whose effects were purely psychological. This latter group tried to use advanced scientific methods and equipment to disprove the effects of qigong. Instead, their own scientific inquiry often led them to gradually become believers in qigong.

Prof. Lu's book summarized some of the major studies performed in the first 10 years of scientific explorations of EQ in China (1978 –1988) with emphasis on his own experimental studies performed with Dr. Yan Xin. The subjects of the book cover the major findings in physical, chemical and biological studies of EQ phenomenon, and the distance effect of EQ. The discussed experiments of EQ include infrared radiation effects, magnetic effects, electromagnetic wave and infrasonic wave effects, bi-directional effects, multi-functionality and target adaptability, spatial characteristics (distance effect) and automatic targeting capacity, temporal characteristics (two after-effects), as well as the ability to affect matter at a microcosmic scale (such as molecules and atomic nuclei). These have long been the subjects of PSI exploration, parapsychology, as well as topics of discussion for the SSE; and they refer to mostly the areas that mainstream scientific studies have not yet touched upon to any great extent. If you are an earnest scientist who does not simply deny phenomena that science does not currently have an explanation or answer for, or you are planning to conduct scientific research on qigong and its applications, and/or you are seriously looking for qigong's scientific essence, this book will definitely be a helpful resource for you. Among other things, it can give you some background of EQ studies in China in the 1980s and an understanding of how challenging or difficult it can be to conduct serious research on qigong or human subtle energy in general.

As an experienced research scientist as well as a qigong practitioner, I would like to share some perspectives about this unique book. Given the fact that there has been little serious research on qigong in the U.S., or in western countries in general, it is very important to recognize the strengths and potential weaknesses of Prof. Lu's book and also of other related research studies so as to help others to conduct research in this area more efficiently or more creatively and to avoid replication of similar mistakes.

This book introduces some truly interesting and challenging studies with much impressive strength. Even though many studies were flawed by some debatable methods or design errors, or came to incorrect conclusions, most of these studies are performed by creditable scien-

tists in China whose scientific ability well qualify them to verify the existence of EQ, or human subtle energy. This is important because the challenge of creating genuine interest in this subject as serious research within the mainstream scientific community is still a critical issue. The participation of these particular scientists therefore becomes noteworthy. Additionally, the authors' genuine scientific attitude toward facts and data, and the spirit of incessant exploration for truth can be found throughout the book. Moreover, their scientific integrity was not affected by changing political pressure or the existent framework of accepted scientific knowledge and is also evidenced by how exceedingly careful they were in the analytical processes used to reach their conclusions, although not all readers will agree with their conclusions. This reminds me of another book that claimed to explore the scientific nature of qigong and criticized some of Lu's research studies of EQ (Lin et al. 2000). In that book, the authors tended to deny the existence of EQ based on their own pre-drawn conclusions and a few failed experiments whose parameters were not closely examined. They made their conclusions prematurely without knowing exactly what they were actually studying (Lin et al. 2000).

In contrast to the claims or opinions of those whose work is framed by limited knowledge and misunderstandings, Prof. Lu and his colleagues have performed work in this field that is both pioneering and reliable. Prior to any criticism of their studies, design, and/or conclusions, we must keep in mind the circumstances under which they undertook these studies. Although many scientists were involved in the exploratory studies of EQ in China one way or others, the official government policy about research on qigong and PSI phenomenon has long been known in China as "the three No's" – no debate, no criticism, and no promotion – while allowing a small group of scientists to conduct exploratory research. This kind of research was not well funded or supported by the government or any foundations. Prof. Lu and his colleagues did not have the requisite funding or other necessary resources for their studies. They worked under great peer pressure and risked their own reputations in their original scientific specialties as they became involved in non-mainstream research. Persistence in qigong research even caused some of them to lose opportunities for promotion and advancement in their field. The major force that made them continue their restless inquiry and scientific exploration of qigong was their scientific conscience and the imperative to follow the facts to their source. Moreover, Lu and his colleagues carefully defended their methodology in this rare and challenging area of scientific inquiry, which have made their results even more convincing and enlightening.

Lastly, they offered some preliminary but promising theoretical hypothesis in an attempt to explain observed qigong phenomenon and have created a very important foundation that others can use as a basis for their own work. In some ways, studying EQ is similar to studying PSI phenomenon since many well-trained qigong masters have both psychokinetic and ESP capabilities. No existent theories can really explain the fullness of the qigong phenomenon adequately, but courageous hypotheses based on carefully designed observation and data are always an important step to advance what we already know and an effective means to attract more scientists into this controversial, but important, research area.

Nonetheless, we may derive greater benefit from these studies if we also recognize what might have been missed or what might be wrong in this book. With this in mind, I offer the following additional points that could have made the book or the studies better. First, what is qi, or what is external qigong? The subject of their studies was not well defined in this book. Due to

historical limitations, the author tended to include all observed qigong phenomena and then labeled all of them as external qi. There are two definitions currently in use that can be helpful in defining the subject study area. The first is Prof. Lin's definition; qigong is a method or process "through qi (vital energy) and yi (consciousness or intention) cultivation to achieve the optimal state of both body and mind" (Lin 1997). When utilizing this definition, yi, the intention or mental process of the practitioner, is integral to the qigong process and may play a more important role in the observed effect of EQ than is explored in this book. Although a narrative study of EQ could focus on the qi or vital energy part only, qi itself cannot be truly defined or measured without including yi, or intention. But this becomes confusing, especially in a research model, which leads us to the second definition. In the 1980's to avoid confusing definitions of EQ among researchers, the Chinese Society of Qigong Science used the following definition for "external qi" in their documentation and research projects: "*The distant and directional effects produced by a well-trained qigong practitioner under the qigong state"* (Lin 1984*).* This definition specifies three major characteristics of EQ: a) EQ exists only when a well-trained qigong practitioner enters into a qigong state (coincident with what is now called "altered state of consciousness;" not among ordinary people or in an ordinary state); b) it can travel a distance from the practitioner; and c) it is directional in that can be applied to a specific target far away, while not affecting nearby objects where the intention is not focused. Although this definition is still incomplete, it is usable as a way of considering what EQ is or is not.

Secondly, due to his background in physics and the lack of a proper definition of EQ, most studies cited by the author involved the physical signals of EQ, such as infrared radiation, gamma ray, electron magnetism, or infrasonic sound, which are all qualified to verify the existence of EQ, but touch only a small part of the unknown form of biological energy. Let's take the far-infrared measurement as an example. It is very easy to misunderstand the nature of qi as a kind of far infrared radiation. Actually, far-IR may just be a secondary signal, or a side effect of EQ, since its intensity is just in the magnitude of μw and could not achieve the healing we observe in qigong therapy. There are many misleading conclusions similar to this. For instance, some infrasonic sound (9-13 Hz) was detected during qigong practice. However, this is just an accompanied response that occurs when the qigong practitioner concentrates, not the effect of EQ itself. Many people who never practice qigong may also produce this type of signal (although not as strong as a qigong practitioner's) and, more importantly, their signal is not directional according to the emitter's intention but goes out in all directions. Since yi and qi were not differentiated in this book, we know that these reported physical signals (electromagnetic wave, particles, infrared etc.) could not travel 1000 miles with the same strong effect, and we know that it was impossible for the same physical signals to produce the inhibitory effect on e coli growth in one study but accelerating effect in another without following the practitioner's intention (Dr. Feng's studies cited in the book). Therefore, yi, or the intention during qi emission, played more important roles in these studies, while the observed or measured physical signals might just be the side effect of the EQ process or the carrier of the intention or bio-information (yi). Clearly, effective study of EQ requires new methodology and new scientific framework.

Thirdly, the research method was still limited to the traditional verification or laboratory method even though the studied subjects have been human subtle energy and possibly intention or consciousness. Not double-blind randomization method was used in their exploratory studies, which may greatly discount the results or conclusions, since the experimenter effect and meas-

urement bias might all become part of the observed results. For example, distant healing and distant effect is one of the most controversial areas in qigong study. The study with a double-blind design on multiple trials accompanying with randomized qi emission would produce much more convincing reports than the current studies.

Finally, because the role of yi during the EQ process was not accounted for in these studies, some of the discussed research could now be better designed, while some of the preliminary conclusions might be completely erroneous. Studying the mechanism of yi during qi emission may be very complicated from the research perspective, but the use of yi in the EQ experiment could be relatively simple or automatic without imposing too much restriction. For example, in the study of the effect of EQ on the radioactive decay rate of ^{241}Am, the qigong master did not have to know how to change the half-life of ^{241}Am. Perhaps all he needed to do was enter into the qigong state and have his intention change the reading of the radioactive decay rate. This result could be achieved through a variety of means, such as affecting the advanced reading equipment (this has happened frequently in EQ studies), adding additional material or particle (from the air) to the layer of ^{241}Am, or changing the relative position of the tested ^{241}Am within its container without touching it. This later possibility would call upon the qigong master's remote psychokinetic capability. Most qigong researchers in China could not agree with Prof. Lu's conclusion regarding the EQ effect on the half-life of ^{241}Am. Their objection was that, if the half-life of a substance really changed (regardless of how, where or when), when measuring it with the same technique, the result should be constant and should not vary after the EQ emission has ended. The implication of change correlated with the timing of EQ suggests that the temporary change that was measured most likely occurred in the reading only, and not within the matter itself. Many scientists suspected the possibility of slight change in the relative location of the tested ^{241}Am during qi emission or under EQ influence (without physical contact) since Dr. Yan had asked observers to leave the room in most of the studies in order to fully concentrate his intention. This example brings up another weakness of physical signal detectors of EQ in general -- the specificity of the physical detector is usually very poor. A slightly wrong measurement can easily lead to erroneous conclusions. The more complicated or more sensitive the equipment used to detect weak physical signals, the more likely it can be interfered with by the EQ emission; therefore, there is a greater chance of an error occurring in the related conclusion.

Most Chinese scientists tend to agree that EQ may consist of three elements: matter, energy, and information; that it is easy to measure the objective existence of EQ or out of body biofield effect, but it is much harder to measure the essence of EQ or explain the mechanism of qigong therapy. Prof. Lu's book is a very good exploratory milestone for later researchers. Studies suggest that bio-information and intentional power are involved in the qi emission process, but we have little scientific knowledge about this aspect of EQ. If we define EQ based on the findings of the studies reported in Lu's book, we may easily miss the real essence of qi, and mislead the public about its true nature. Many Chinese scientists tend to agree that in order to verify the existence of EQ, the simpler the design and the more robust the equipment, the better the result (Lin, 1984). Regarding understanding the mechanism of EQ, our conventional frameworks of thinking and knowledge are too limited to produce designs that can increase our scientific understanding of qigong; at the same time, our current equipments and technical possibilities are too restrictive and incomplete. Of course, an alternative to scientific qigong research is to personally experience the qigong state by practicing qigong with a qualified qigong master, and

thereby gaining an understanding of the qigong state and how qigong works freely with the intention of a well-trained practitioner experientially. This subjective experiential knowledge might then help to create objective research designs that account for yi as well as qi.

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