Book Review

The Guardian Poplar: A Memoir of Deep Roots, Journey and Rediscovery

Chase Nebeker Peterson
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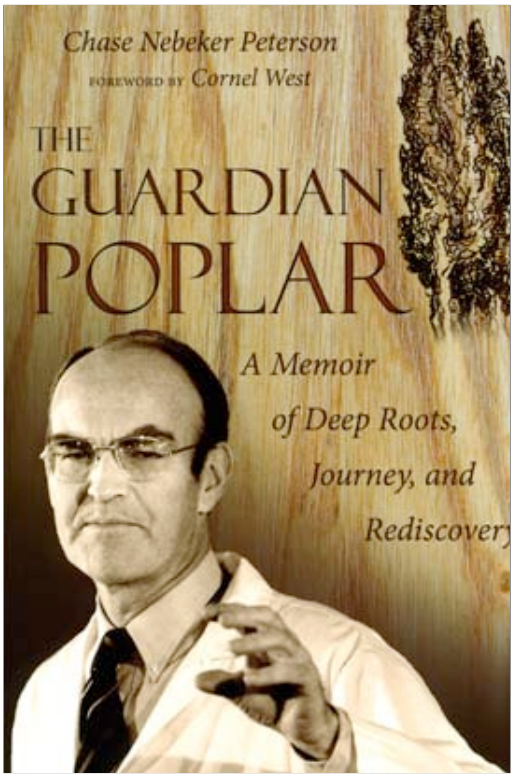
Review by Charles G. Beaudette

[Emphasis on Chapter 12, "They Will Only Laugh at You" : Cold Fusion]



Three national events, a medical crisis and two constant themes formed and grew the sinews of Chase Nebeker Peterson's character and life. Indeed, his autobiography is well titled. He also gives us the word taws, for those who like unusual words.

As dean of admissions at Harvard University he suffered the student upheavals of the late 1960s, as vice-president for medical affairs of the University of Utah he oversaw the introduction of the first artificial heart for a global audience, and later, as president, he midwifed the birth of the cold fusion controversy. While teaching medicine for some years before retirement, he was diagnosed with a fatal cancer which he has successfully held in abeyance for more than 14 years. His two background themes blend together the essences of marriage and children with a genealogical exegesis of his forebears co-mingled with the Mormon westerly migration and the establishment of that community in Utah.

Peterson met the student uprising of 1968 from his position as Harvard's admissions director. What was its intent or purpose, what were its immediate and longer term effects on the university? Unfortunately he offers us no insight into that event. Later, as vice-president of medical affairs for the University of Utah, when it brought forth the first heart artificial pump, the swirl of intense, critical and global media attention hugely surprised him, but he seemed to handle it well. That experience served as a guide when the cold fusion episode began unfolding in front of him starting in the fall of 1988.

In the heart transplant episode, Peterson, as a medical doctor, felt qualified to understand and speak to the topic. However, he found himself in a very different relationship to the cold fusion episode. Medicine and medical care constitute part of the biological sciences, which is itself a substantial part of what is recognized as science. But when it came to the specifics of physical chemistry and nuclear physics, he was in completely unfamiliar territory. As he puts it, "One of the most frustrating aspects of my role in the Fleischmann/Pons affair was that as a nonscientist, I felt I was in no position to make a useful response."

Early in the fall of 1988 a visiting professor, who had just given the school a handsome report on the state of its chemistry department, warned Peterson about an experimental claim by professors Fleischmann and Pons of heat energy production greater than was possible from chemistry. He warned that it would be hard to keep something like that quiet. Peterson shared the warning with his vice-president for research, Jim Brophy. As a physicist, one would think Brophy could give Peterson some inkling of the likely reaction from the physics community. He might also have played a leading role in articulating a response to the early criticism. Surely Peterson felt a substantial lack of support from him and, we note, he gives him only a pro-forma place in the chapter. So Peterson was left very much to his own devices during the cold fusion episode. He started by making inquiries of his own to an acquaintance, Hans Bethe of Cornell, who told him, "They will laugh at you."

The apparent conflict that Fleischmann and Pons sensed with Professor Steven Jones, physicist at Brigham Young University, about forty miles south of Salt Lake City, involved the presidents of the two universities. It amounted to a huge distraction because Jones really had a null experiment; there was nothing there. Fleischmann and Pons were concerned that Jones, having neglected to reveal a conflict of interest the previous summer, might compromise their authorship of discovery. They rushed to establish origination by arranging to have the leading scientific journal in their field publish a summary of their heat generation results on March 22, 1989, and permit them to hold a press conference the next day.

On Thursday, March 23, 1989, Peterson, as President of the University of Utah, opened the press conference at which the chairman of the chemistry department, Stanley Pons, and research professor Martin Fleischmann, announced that they had a table-top experiment operating at room temperature and generating an amount of heat that was quite beyond the capabilities of chemistry. They also claimed that the heat came from a sustained nuclear fusion

reaction that offered only minor neutron radiation. In his brief remarks Peterson articulated the way science works, that "the full story of the research...will not be known for months or years, as others confirm, challenge and enlarge their ideas and their data." Soon Peterson was called for testimony at both the state and national levels. At the university, the National Cold Fusion Institute was set up with $5 million from the state. Things seemed to be moving along in what might be thought of as an ordinary scientific way.

Fleischmann and Pons soon found that their experiment was not absolutely reproducible, although for an October 1989 NSF/EPRI meeting they showed results from 37 experiments, of which 23 displayed excess heat. Not until July 1990 did Fleischmann and Pons present their ten-weeks-long experiment in a 55 page scientific article with its calorimetry set forth so the community could see in detail how it was constructed, operated and the excess heat measured. Those who chose to commit their careers to the new field took about five years to confirm the Fleischmann and Pons effect of excess heat by means of thermodynamic measurement. Also, within this timeframe other experimenters measured the first rough correlations of energy output with a corresponding generation of helium-4 atoms.

Only five weeks after the announcement came, the savage *ad hominem* assault at Baltimore occurred. Fleischmann and Pons were to be laughed at to their faces, and their experimental data was to be derided. Several early makeshift experiments that reported no effect were taken by the critics to govern the field forever. Physicists of nuclear theory proclaimed that, in any event, the effect was not possible—that all experiments producing excess heat must be mortally flawed. Peterson sums up this continuing attitude by telling of an unnamed nuclear physicist from Austin, Texas: "When asked his current view of cold fusion, he crisply responded that the issue had been closed years before when the theory was proved to be error. The questioner then asked, 'But have you read any of the more than one hundred articles that have confirmed the phenomenon?' The Texan's response was simple: 'Of course not; I do not have time to waste on matters that have been closed.'"

That answer deserved and got Peterson's indignation. One of the oldest and most respected branches of physics and chemistry is that of thermodynamics, the science of the measurement of heat energy. Many laboratories using varieties of instrumentation found this Fleischmann-Pons effect (FPE) to exist. The experiments produced more heat energy than could be provided by any chemistry. Science, at its most fundamental core, demands an explanation: What is the source of the excess heat energy? The refusal of these opinionated physicists to go into the FPE laboratory constitutes an intellectual assault on the practice of science.

Fleischmann and Pons' co-experimentalists were to be scorned as credulous. Peterson and his university were now on the defensive. He stood firm on the grounds that the work of Fleischmann and Pons was protected from suppression by the principle of academic freedom. He reminds us that a faculty member in good standing, according to an old Harvard saying, could do whatever research he chose as long "as he didn't get his name in the papers and didn't alarm the horses." But when the University of Utah Faculty Senate chose to take what was considered to be a "no confidence" vote, Peterson announced his plans to retire.

Peterson, as he presents himself in this book, does not seem to be aware that the successful student revolution that he witnessed at Harvard in 1968 demoted academic freedom from its then 200 year old Enlightenment position as the highest principle of the university mission. This radical change was, and is, imposed physically by the muzzling of opposition, removal of university regents, chancellors, presidents, and more recently, Larry Summers as president of Harvard. As Fleischmann explained in his address to the British Association for the Advancement of Science in 1992: America has established itself as a conformist society. The issue was not that Fleischmann and Pons' work was wrong; the issue was that it must stop. If officers and professors of the University of Utah were violating the judgment of the public view, some reason or method would be found and advanced for them to step down.

After retirement Peterson was diagnosed with a fatal cancer which he has successfully held in abeyance for more than 14 years. But each successive treatment is somewhat less effective than the preceding one. His discussion of this event, like other topics in this book, goes very deep. With the disease's data, he has a measure at each step of when the end of life might occur and, in this way, he shares with the reader his thoughts, which he clearly has explored with his family, of how to arrange the end. One of the incidental themes of this book is Peterson's strong response of profound pleasure to the best of classical music. With that in mind, his formula is one that might be designated as the "three M's" method of managing the end. The three M's are Mozart, Mahler and morphine.

Peterson courageously took a leading role to place Fleischmann and Pons' discovery of the excess heat effect before the world, and did so with all propriety. He was right in his statement that it would take the scientific community three to five years to evaluate it, which it did. None, except nuclear physicists, could have foreseen the savagery of the attack that exploded before a scientific evaluation of the ten-week-running-time experiment had even begun. Nor can one say with assurance that avoiding the press conference type of announcement altogether, but proceeding openly with the Fleischmann-Pons research activity, would have prevented or even lessened the likelihood of an assault and its unfortunate consequences.

Peterson took a principled position based on academic freedom in March 1989 and continued it during the months that followed. Twenty-three years later that still looks like the proper position for him to have taken.