munities that was a key factor in the history of the reception of the concept of the meson.

As the 1930s were a time of extreme conceptual confusion in twentieth-century physics, no coherent explanation of selected representative evidence can satisfy everyone. And, in fact, the authors' attempt to achieve coherence actually produces some overlapping and fragmentation. Their effort to trace the conceptual development of physical ideas, their own historical narrative, itself lacks conceptual clarity. A simple "census" of the population of physicists would have helped; fundamental theoreticians, pragmatic theoreticians, and experimental physicists are three (very) different species. If we remember the variety of worldviews represented among these physicists, we can better understand such matters as Bohr's long-term adherence to the idea of the nonconservation of energy and the paralyzing effect of the wait for a true relativistic theory of quanta that was deemed to solve all paradoxes and "catastrophes."

It was only with George Gamow's nimble application of quantum-mechanical tunneling (a theory developed by his Russian colleagues Leonid Mandelshtam and Mikhail Leontovich) to alpha decay that the first quantum nuclear theory emerged. This first success merits more attention than it receives from Brown and Rechenberg, who merely refer to it briefly in their "Prologue." Similarly, the First Nuclear Congress, held in Rome in 1931, is too important an event to be mentioned simply in passing; it was, after all, the occasion of the first public debate on Pauli's neutrino hypothesis as opposed to Bohr's nonconservation hypothesis, and Bohr's view prevailed.

Although Brown and Rechenberg demonstrate the costliness of mistaken theories and erroneous ideas, they do not show how misconceptions (such as nonconservation and pair-exchange) can sometimes play a helpful role, providing a kind of scaffolding for the construction of successful hypotheses.

While Brown and Rechenberg criticize contemporary physicists for "misread[ing] Heisenberg's paper" (p. 52), I am afraid some elements in their book suggest misreading is permissible for historians. We may allow an original thinker such as Yukawa to speak of a "divine message forbidding us to think about any other particle" (p. 11) without pressing him to elaborate, but we cannot extend such an indulgence to historians. They must attend to all relevant human messages—and try to interpret them. Thus Brown and Rechenberg should have understood the significance of the letter Igor Tamm published in *Nature* in 1934, which both "heartened" Yukawa and "opened" his eyes (Yukawa's own words, quoted on p. 105). And they should be able to apprehend why Tamm valued his "unsuccessful" work much more than his work on the theory of Vavilov-Cherenkov radiation, for which he won the Nobel Prize.

Brown and Rechenberg's failure to explain the value of Tamm's note for Yukawa is not the only instance in which the contributions of Russian physicists are overlooked. (One visual error that exemplifies this general oversight appears in the caption on page 16. It should be P-transformed: Gamow is on the right, not the left.) It is true, however, that Russian historians, myself included, must take responsibility for not making a greater effort to help Westerners penetrate the Cyrillic barrier. Had we done so, Pauli's comment about "Russian quite interesting work" [*sic*] (p. 268) would not have remained unsubstantiated; Brown and Rechenberg would have mentioned the 1947 monograph entitled simply *Mezon* (Moscow: GITTL); and they would not have omitted the telling and tragicomic story of "varitrons," the large family of particles "discovered" by A. Alichanow and A. Alichanian, for which they received the Stalin Prize in the late 1940s.

Some underconceptualization, however, has its advantages. Readers of this book, for example, have an exciting opportunity to live through this unique period of discovery and creation virtually, and to try on their own to match its great minds in overcoming its intellectual challenges.

GENNADY GORELIK

F. David Peat. *Infinite Potential: The Life and Times of David Bohm.* vii + 353 pp., illus., index. Reading, Mass.: Addison-Wesley, 1997. $25.

Once considered a heretic and an outcast, David Bohm (1917–1992) is now increasingly regarded as one of the greatest and most original thinkers of postwar physics. A drill officer's hopeless conclusion about the young Bohm, "There are some people who just can't march with others," turned out to prophetic, equally applicable to Bohm's physics and to his politics, epitomizing his lifelong marginality. But despite a growing literature on Bohm's theories, little has been written about their author. The full story of Bohm's unusual life is told for the first time in David Peat's book.

Born in Pennsylvania to a dysfunctional family of Jewish immigrants, Bohm studied mainly by himself. He tried graduate school at Caltech and, for nine months, membership in the Communist party, but in both cases dropped out, dissatisfied. In politics, Bohm remained an unorthodox Marxist with a particular interest in dialectical philosophy. He received his doctorate in physics from Berkeley in 1943, officially under Robert Oppenheimer, who by then was already occupied with the Manhattan Project. Bohm was not granted a security clearance to go to Los Alamos and worked on plasma at Berkeley Radiation Laboratory. Toward the war's end, he discovered his own domain in physics: the collective behavior of particles. As an assistant professor at Princeton, he, together with several graduate students, established the foundations of plasma theory, and he published a highly influential textbook on quantum mechanics. In 1951 this promising career came to a halt, as Bohm encountered serious problems with both the political and the scientific establishments.

After Bohm was subpoenaed to testify before the House Un-American Activities Committee and took the Fifth Amendment, an anticommunist and probably anti-Semitic university administration suspended him from teaching and did not renew his contract. The "tainted" physicist could find another academic job only in São Paulo, but Brazilian exile did not save him from further political persecution. His passport confiscated by consulate officials, Bohm could not travel abroad, and in 1954, in order to accept a position in Israel, he obtained a Brazilian passport, thus, de facto, losing his American citizenship. While these events unfolded, Bohm developed and published his hidden variable theory, demonstrating that quantum mechanics and the principle of causality are not logically irreconcilable. Instead of going along with the mainstream in physics in calculating effects, he wanted to penetrate to the very foundations of physics. But such independent speculation was not encouraged in the postwar community, which at that time accepted the Copenhagen interpretation as dogma and chose to ignore or to ridicule Bohm's critical findings.

After 1957 Bohm worked in Britain, first in Bristol and then at London's Birkbeck College. In the 1960s, after years of virtual marginalization, his ideas inspired other important advances. John Bell, and Bohm himself, with Yakir Aharonov, predicted counterintuitive, but subsequently verified, experimental effects that shifted the contemporary understanding of quantum theory from noncausality to nonlocality. Right up to the end of his life, Bohm pursued his search for a new, unconventional physics, while publishing ever more extensively on philosophy of science and consciousness. Although his earlier science was inspired by Marxism, he eventually became just as disillusioned with communism as he had been with capitalism. His philosophy evolved through Hegelian dialectics to dialogues with Jiddu Krishnamurti, a famous Indian guru who preached transcendental transformation of consciousness. Through his collaboration with Krishnamurti, Bohm became arguably the most important scientist who can be claimed by the New Age movement and who explains science to its wide audiences—an association that partly accounts for the lasting popularity of his books.

David Peat, Bohm's one-time coauthor, has written a nontechnical, sympathetic, but not uncritical biography, based to a significant degree on personal acquaintance, Bohm's tape-recorded recollections, and memories of friends and colleagues. Like many of the best works that rely on such sources, it is rich in important information that can be found nowhere else, although it is not always rigorously accurate in detail (for example, Melba Phillips told me that some of Bohm's letters to her from Brazil are here dated incorrectly). The book presents a fascinating picture of Bohm's life, including its psychological and sexual aspects. As for Bohm's science, that awaits another, more thorough analysis.

ALEXEI KOJEVNIKOV

Daniel Albright. *Quantum Poetics: Yeats, Pound, Eliot, and the Science of Modernism.* x + 307 pp., illus., bibl., index. Cambridge/New York: Cambridge University Press, 1997. $54.95.

Daniel Albright states that *Quantum Poetics* does not concern itself with science but with the appropriation of scientific metaphors by poets; moreover, he says, such appropriations are perforce misappropriations. If one were to skip over this claim (or disclaimer), focusing instead on the text's title and its subtitle, "Science of Modernism," then one might have quite an argument with Albright's study. Although Albright does undertake the major effort of examining the relationship between modernist poetry and science, he does not lay the groundwork necessary for establishing this relationship. He assumes, for instance, that his typical reader will be conversant with the basics of quantum physics in the early twentieth century. And in fact one needs such a historical background to be able to entertain Albright's claims about the literary appropriation of scientific discourse in the reshaping of modern poetics. More seriously, Albright