

## Behind the scenes at Solvay

### The Quantum Ten A Story of Passion, Tragedy, Ambition and Science

**Sheilla Jones**  
Oxford U. Press, New York, 2008.  
\$24.95 (323 pp.).  
ISBN 978-0-19-536909-0

Reviewed by Michael Eckert

"Erwin Schrödinger's second preoccupation was women." So begins a chapter entitled "Shock Waves" in *The Quantum Ten: A Story of Passion, Tragedy, Ambition and Science*, by Sheilla Jones. Other chapter titles, for example, "The Quantum Showdown" and "Drawing the Battle Lines," indicate that such prose is the rule rather than the exception. One would expect that kind of sensationalism in the gossip column of a newspaper rather than in a book published by Oxford University Press. Anyone familiar with the scholarly discourse about the origins of quantum physics will approach the kind of popularization offered in *The Quantum Ten* with some scepticism. As a professional historian of physics asked to review the book, my first reaction was in that vein: I thought I'd either simply deny the offer or suggest that the book does not merit review in PHYSICS TODAY. Given its focus on personal passion and tragedy, how could the book's readers hope to understand the intellectual turmoil caused by the advent of quantum mechanics in the 1920s?

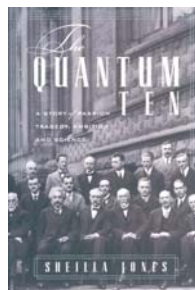
A closer inspection of *The Quantum Ten*, however, reveals that Jones's approach has its virtues. The author, a science journalist with a master's degree in physics, constructs her narrative around key participants of the 1927 Solvay Conference (the number in the title should not be taken literally), including Albert Einstein, Schrödinger, Niels Bohr, Max Born, and Werner Heisenberg. According to the conventional wisdom of the physics community, disputes about the meaning of quantum mechanics climaxed at the

**Michael Eckert** is a historian of physics at the Deutsches Museum in Munich. He has edited Arnold Sommerfeld's scientific correspondence and is now writing a biography of Sommerfeld.

conference. Bohr's indeterministic Copenhagen interpretation emerged as the winner, and Einstein's opposing deterministic interpretation of the quantum world, epitomized by the saying "God doesn't play dice," came out the loser.

However, biographical and other historical investigations during the past decades have shown that the debates were more than a mere clash between a Copenhagen cohort of Bohr, Heisenberg, Born, and company and a dissenting camp of Einstein, Schrödinger, and Louis de Broglie. For example, later this year Cambridge University Press plans to publish a new book by Guido Bacciagaluppi and Antony Valentini, *Quantum Theory at the Crossroads: Reconsidering the 1927 Solvay Conference*. Jones cites the work (available at <http://arxiv.org/abs/quant-ph/0609184>), which concludes that things were not as clear-cut as the spokesmen of the Copenhagen interpretation have made us believe. Bacciagaluppi and Valentini relate that Heisenberg, probably sincerely, proclaimed that "this conference has contributed extraordinarily to the clarification of the physical foundations of the quantum theory." On the other hand, they quote participant Paul Langevin, who described the conference as an event where "the confusion of ideas reached its peak." In brief, what has emerged as the Copenhagen interpretation is far from a uniform view shared by Bohr, Heisenberg, and Born, not to mention Wolfgang Pauli, Pascual Jordan, and others who participated in the discourse. Nor have the debates about what quantum mechanics means been settled, as is evident from the post-1927 paradoxes associated with Schrödinger's cat and the famous Einstein-Podolsky-Rosen paper of 1935.

Based on studies of the recent history of physics and the biographical literature of a number of the participants at the 1927 Solvay Conference, Jones tells an intriguing behind-the-scenes story of the development of quantum physics. She keeps the narrative from being mere gossip, in part because she benefits from excellent sources. The bibliography includes the authorita-



tive biographical literature—Martin Klein's study of Paul Ehrenfest, a prominent figure throughout Jones's book; David Cassidy's biography of Heisenberg; and others—along with more recent work like *Quantum Theory at the Crossroads*. In view of present quantum experiments that are sparking new interest in the

historical debates of 80 years ago, one might have wished for a stronger emphasis on the scientific content of those disputes. The predominance of the personal keeps the physics at a minimum. Where it is unavoidable to delve into the quantum riddles, however, Jones displays an admirable talent for transmitting the essence of the subject without digressing into technical detail.

*The Quantum Ten*, therefore, should not be dismissed as just another story of scientific heroes. Anyone interested in the emergence of quantum physics and the debates about its foundations will be thrilled by the controversies among its protagonists. So far, no one has portrayed that crucial episode of 20th-century physics in such an easily read, down-to-earth manner as Jones. If one or another aspect is painted too sketchily, the reader can consult the bibliography to find the pertinent expert literature.

### Statistical Physics of Particles

**Mehran Kardar**  
Cambridge U. Press, New York,  
2007. \$75.00 (320 pp.).  
ISBN 978-0-521-87342-0

### Statistical Physics of Fields

**Mehran Kardar**  
Cambridge U. Press, New York,  
2007. \$75.00 (359 pp.).  
ISBN 978-0-521-87341-3

Several years ago while Mehran Kardar and I were sitting outside a coffee shop in Berkeley, California, and discussing the behavior of a system that interested us, he conceived of and sketched a