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Book Review: Schrödinger: Life and Thought

Schrödinger: Life and Thought. Walter Moore, Cambridge University Press, Cambridge, 1989, 519 pp.

How many different jobs did Schrödinger have? What jobs did he turn down and why? Was he a good teacher? What did Schrödinger do before the wave equation, and what did he do after it? Why did he seek a wave equation for quantum mechanics, how did he derive it, and how did he interpret the wave function? How were the early Nobel prizes for quantum theory decided? Moore does much more than answer these technical questions. He paints a vivid picture of Schrödinger as a person and what it was like to be a physicist in an era marked by two world wars.

In the preface Moore quotes Montaigne, "our life is divided betwixt folly and prudence." The book does not shy away from the complexity of Schrödinger's personal life and includes photos of several of his mistresses, to one of whom he writes, "I did not write everything down at once, but kept changing here and there until I finally got the equation. When I got it I knew I had the Nobel prize." When he did finally get the prize it was nine years later and he had already passed from his position at ETH, to Planck's chair in Berlin, to exile at Oxford. The prize was announced on the day Schrödinger became a newly installed Fellow of Magdalen College. The President of the College remarked to Schrödinger that, "I was truly astonished, for I had thought that you had the prize."

As the book is written for a general audience, Schrödinger's philosophy, poetry, and loves get almost as much attention as his physics. He seems to have been influenced by philosophical issues more than is the average scientist, and even wrote a book, *Meine Weltansicht* (My World View) shortly before the discovery of his wave equation. Schrödinger also published a book of poems. I used his book on *Statistical Thermodynamics* (95 pp., costing $1.45 in 1968) as an undergraduate and found it crisp and clear. Moore describes Schrödinger's book, *Space-Time Structures*, as the *vade mecum* for two generations of students of general relativity, and his *What is Life* is credited by Watson for sparking his research in DNA. His thoughts on psychobiology presented in his book *Mind and Matter* address

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even deeper matters, but have not has a comparable impact. Moore does not accept Schrödinger's work at face value, but judges it critically with a penetrating focus at a level which physicists can appreciate, with equations supplied where appropriate. There are two orders of magnitude more equations here than can be found in Hawking's *A Brief History of Time*. Alas, the relative number of sales will probably be two orders of magnitude smaller for Moore.

Even before the wave equation Schrödinger was a mandarin of European physics. His work was strongly influenced by the Vienna statistical mechanics school going back to Stefan and Boltzmann. Along these lines one can also read P. A. Hanle's 1975 Yale Ph.D Thesis on Erwin Schrödinger's Statistical Mechanics and E. W. Montroll's article On the Vienna School of Statistical Mechanics in the *AIP Conference Proceedings*, No. 109. His early work on Fokker–Planck equations, first passage times, and lattice dynamics leads Moore to describe Schrödinger in 1918 as "a master of statistical theory, who was able to fill with distinction the vacancy left by the untimely death of Smoluchowski." The faculty committee considering Schrödinger's appointment to the Max Planck Chair in Berlin noted "his versatile, vigorously powerful, ... profound style... in the treatment of problems of statistical mechanics, analysis of optical interference, and physiological color theory." He taught courses on Molecular Statistics and Quantum Statistics shortly before his Nobel prize-winning work. When he left ETH the students gave him a rare torchlight parade. He said that "wave mechanics was born in statistics." He did, however, reject the Copenhagen probablistic interpretation of the wave function and challenged it by turning Einstein's superposition of unexploded and exploded gunpower into the now famous Schrödinger's cat with its mixture of live and dead states.

The research behind this book appears to be extensive and benefits from the help of Schrödinger's eldest daughter, as well as his own notes and diary. Moore portrays in a comprehensive fashion the brilliant student fulfilling the promise of his youth. He has produced a classic. The science is approached in an honest fashion, and Schrödinger's life is complex enough to keep the reader turning pages.

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