Apart from the fact that these three books have been published by the same publisher, they do form a connected whole. In fact, they should be in anyone's library who is interested in the philosophy of quantum mechanics and quantum field theory. Many, if not too many, books have been written on the subject of (the philosophy of) quantum mechanics. However, a recurring feature of these treatises is a more or less sloppy use of the underlying mathematics, a heavy reliance on metaphors, in some cases rather misleading metaphors. I tend to call such an approach to quantum mechanics a *do-you-get-the-picture* approach. The usual result is that after reading such a book, one finally wants to know what it really is all about. If so, my answer is: read Michael Redhead, then read Henry Krips, and finally, try to get an idea of the maddening complexity of the problems in quantum field theory. Their most important characteristic is their *this-is-the-picture* approach.

Michael Redhead's Incompleteness, Nonlocality, and Realism is an excellent introduction to quantum mechanics. The first two chapters (*The Formalism of Quantum Mechanics*, *The Interpretation of Quantum Mechanics*) make the reader familiar with the mathematics and the standard interpretations of quantum mechanics. No need to consult other introductions to find out what an eigenstate really is. Chapters three and four (*The Einstein-Podolsky-Rosen Incompleteness Argument*, *Nonlocality and the Bell inequality*) discuss the famous EPR-argument, leading to the Bell inequality. Chapters five and six (*The Kochen-Specker Paradox*, *Nonlocality and the Kochen-Specker Paradox*) discuss another important, though probably less well known by the philosophers at large, problem in the foundations of quantum mechanics. The last chapter (Realism and Quantum Logic) raises the important issue of the underlying logic of quantum mechanics. In Redhead's words: a total theory consists of a logical and a physical part, T = L + P. If P stands for classical mechanics, then quantum mechanics forces us to replace P by P'. Or, better still, T is replaced by T'. Usually one assumes that T' = L + P'. But, a second option is to change the logic: T' = L' + P. Thus formulated, it becomes clear that there are two basic complementary approaches to the problems of quantum mechanics. It is hardly a surprise to this reviewer that Michael Redhead's book was honoured with the Lakatos award.

Now that you have a first picture of the intricacies of quantum mechanics, enjoy the full philosophical flavour and complexity of the subject and turn to Henry Krips' excellent study. Krips is, stylistically speaking, without any doubt, a modern philosopher of science. All important reasonings and arguments

are presented as logico-mathematical proofs. This way of working does not make for easy reading. However, it does make clear all the hidden principles and lemmas that are usually assumed and hardly ever written out in full. At the end of the book, among the appendices, there is a separate list of such principles: more than *seventy* principles are mentioned. It is really impossible in this review to present a general outline of Krips' interpretation of quantum mechanics. Fortunately, this is being done in the appropriate journals, such as *Philosophy of Science*. Do note that Henry Krips favours a particular interpretation, namely the, or rather, a realist one, in a rather particular sense of real. The book therefore rightly emphasizes hidden variable theories (basically, theories that aim to explain the incompleteness of quantum mechanics as incomplete knowledge of the physical system, not as an essential feature of the system itself). As said, this book deals with quantum mechanics in such a rigorous fashion, that it deserves the title of exemplar - however problematic this Kuhnian notion - for philosophers of science.

There is a non-zero probability that the reader will now think he or she knows all about quantum mechanics. No doubt, this is (almost) true. It would however be a mistake to believe that the realm of atomic and subatomic particles, waves and fields holds no more secrets for the intelligent reader. For, up to now, we have been talking about non-relativistic quantum mechanics. What about the relativistic case? It is this reviewer's impression that philosophers are at the very beginning of exploring this (mine) field. I, therefore, do not hesitate to recommend the book of Harvey R. Brown and Rom Harré, although it is a collection of nine essays. They are grouped in four sections: *Quantum Field Theory as Object of Philosophical Study* (Michael Redhead and James T. Cushing), *The Problems of Virtual Particles and Renormalization* (Robert Weingard, Rom Harré, and Paul Teller), *Covariance Principles in Quantum Field Theory* (Gordon N. Fleming and Tian-Yu Cao), and *Mathematical Foundations of Quantum Field Theory* (Ray F. Streater and Simon Saunders). Some of the papers are quite accessible, such as Michael Redhead's *A Philosopher Looks at Quantum Field Theory*, others are highly technical, such as Gordon N. Fleming's *Hyperplane-dependent Quantized Fields and Lorentz Invariance*. Notwithstanding this fact, the most important conclusion one can draw from this collection, is the fact that quantum field theory is a subdomain of physics that has to deal with its own particular problems. A conclusion valid for quantum mechanics as well. As a matter of fact, some authors defend the idea that some problems of quantum mechanics disappear in the relativistic case alto-

gether - the particle-wave duality ceases to be relevant as only fields come into play -, whereas the renormalization problem - how to deal with the infinities that seem to crop up everywhere - is highly typical for quantum field theory.

One can only express the hope that in the near future a more coherent philosophical treatise on quantum field theory will appear of the same quality as Michael Redhead's and Henry Krips' contributions to quantum mechanics.

Jean Paul Van Bendegem