University of Texas at El Paso

From the SelectedWorks of Juan Ferret

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Preface

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Preface

This volume is a compilation of reflections from some of today's leading physicists and philosophers of physics on the status and relevance of foundational inquiry in their field. The contributors provided responses to six relatively open questions concerning the relationship between philosophy and physics and provided their assessments of the scientific community's progress with respect to fundamental problems in physics itself.

Rather than compiling an anthology of articles, our plan was to follow the example of previous interview books from Automatic Press: We hoped to gather a collection of conversational and informal responses from luminaries in the field with relatively little editorial meddling from us. We intended our questions to elicit frank and general assessments of the foundations of physics, its scope, prospects, and future direction.

One of our goals was to convey the significance and liveliness of philosophical engagement with physics and to give readers a sense for some of the personalities involved in this enterprise. We believe that this more conversational format allows the book to serve as an accessible resource for students finding their bearings in these debates. For more seasoned scholars, the format may provide interesting new insights and at least a few genuine surprises. On more than one occasion in this volume, breaking with the standard format of academic publication has encouraged contributors to respond in more general or speculative ways than one might ordinarily expect.

♦

A short note of explanation on the logistics of this project is in order. We posed six questions to our potential contributors and encouraged them to respond in a manner of their choosing. These are the questions we asked our participants:

1. What is the relationship between philosophy and physics? What should the relationship be?

2. How did philosophers contribute or fail to contribute to the development of physics in the 20th century?
3. What aspect of current work in physics can benefit most from collaboration with philosophers?
4. What area in contemporary philosophy of physics is most fertile?
5. In your opinion, which area of physics holds the most exciting promise in the coming decades?
6. How were you initially drawn to the field and what are some examples of your work that have influenced the discipline?

Some responded to each question in turn, giving more emphasis to some over others. Some chose to skip questions altogether and instead concentrated on what they see as the most significant issues. Notably, several of our contributors did not comment on the relationship between philosophy and physics, focusing instead on physics and its future.

The sense from most of these contributors is that recent collaborations and debates between physicists and philosophers of physics bode well for fruitful interaction in the future. Some contributors stress the need for more effective collaboration among specific types of specialists. Roland Omnès suggests that "The superposition principle is basically a mathematical statement and, along a complementary direction, I believe that a triangular collaboration between philosophers, physicists and mathematicians could be very fruitful." Richard Healey offers the following recipe for success: "Any individual seeking to contribute to our collective understanding has his or her own talents. Fortunately, the community can benefit from the contributions of people with different mixtures of abilities. This requires only that all contributors abandon arrogant professionalism and seek to combine a common spirit of sociable humility with intense and rigorous critical exchange."

Tim Maudlin reminds us that "... the most prominent physicists have generally been philosophers of physics: Newton, Einstein, Bohr, Schrödinger and Bell to name some of the most obvious. Indeed, the most profound philosophers of physics have been professional physicists rather than professional philosophers." Maudlin is undoubtedly correct to point out that the philosophy of physics is an inclusive enterprise. In spite of the influence of specialization, it is vital that discussion of foundational questions include both professional physicists and professional philosophers.

As several of the contributors note, natural philosophy as understood by Galileo, Descartes, Leibniz, and Newton had no place for a strict distinction between philosophy and physics. Insofar as foundational questions in physics are concerned, this attitude still seems to have merit. The disciplinary borders marked by departmental affiliations, journals and the like are of relatively minimal importance in these contexts. John Earman, for instance, argues that " if 'philosophy' is taken in a broader sense that is not constrained by the current disciplinary boundaries, then... when it comes to basic issues in the foundations of physics, the distinction between philosophy and physics blurs. The activity in this area is perhaps best described by a term that has fallen out of usage—'natural philosophy'." Carlo Rovelli echoes Earman when he writes that "The relation between physics and philosophy is much stronger than most physicists and most learned people generally assume today."

It has been an honor for us to work on this project and we are very grateful to our contributors for participating. We hope that readers find these responses challenging and stimulating.

Juan Ferret and John Symons
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