

Afterword

This volume is conceived as a project in history and philosophy of science. Such a project, in my understanding, is based on a rich exchange between historical and philosophical analysis. That exchange, in his volume, goes largely in one direction. I have tried wherever possible to provide illustrations in the history of science of the various philosophical claims made. It is too easy to drift off into pleasant but wild speculations in our philosophical analyses. To populate the narrative with real examples from the history of science is a powerful control on such excesses. It is a discipline whose use I encourage.

A similar discipline has led me to quote extensively from the literature in philosophy and philosophy of science itself. Once again, in repeated assessments and reassessments of it, it is too easy to drift off into caricatures of what that literature asserts. An effective discipline is to illustrate, copiously, claims attributed to the literature by quoting the words of those who proposed them.

Finally, this is a project in history and philosophy of science that seeks to correct a trend in the field of history and philosophy of science itself. Philosophy of science, written without close contact with the history of science, tends towards idealized narratives. Its oversimplifications are soon revealed by exposure to the history of science. The real practice of science is complicated and messy. A full appreciation of all its subtleties requires diligence, dedication and a willingness to develop a rich understanding of the science itself. Too much work in history and philosophy of science pursues what I regard as an unfounded skepticism. The leading idea is that scientists are naïve and credulous in believing what is in their textbooks. The mistake, we are to suppose, is revealed by a closer examination of the messiness of the history and by attention to the skeptical philosophical theses that are supposed to follow from the history. Science, in this view, is indissolubly conditioned by its historical context and scientists overestimate the reach of their methods.

Here I dissent. It is undeniable, I believe, that science has enjoyed immense success, unmatched by any other human enterprise. What is distinctive about science is that its successes transcend the historical circumstances of their creation and are portable across time and culture. That success is not distributed uniformly across all the sciences. Some are still in a rudimentary,

unstable state and deserve criticism. If we focus on these sciences, we do find failures. The danger is to generalize from them to all sciences; to propose that all sciences fail in the same way; and, worse, to deny the very possibility of the sort of success scientists claim.

The failure of these generalizations is demonstrated by the profound successes of many sciences. These include the sciences I know best, physics and chemistry. I do *not* generalize their success to all sciences. That would make a mistake comparable to the mistaken generalization I see in present work in history and philosophy of science. Instead, my point is that science has available to it methods that can yield this level of success and that they have been employed successfully in at least some sciences.

History and philosophy of science can offer significant insights into science. Some will be negative in displaying failures. Others, such as offered in this volume, will justly celebrate the successes of science and will do so with a full understanding of the messiness and complications of real science.