In this book, T. L. Short places the notorious difficulties of Peirce’s important writings in a more productive light, arguing that he wrote philosophy as a scientist, by framing conjectures intended to be refined or superseded in the inquiries they initiate. He argues also that Peirce held that the methods and metaphysics of modern science are amended as inquiry progresses, making metaphysics a branch of empirical knowledge. Additionally, Short shows that Peirce’s scientific work expanded empiricism on empirical grounds, grounding his phenomenology and subverting the fact/value dichotomy, and that he understood statistical explanations in nineteenth-century science as reintroducing the idea of final causation, now made empirical. Those innovations underlie Peirce’s late ideas of a normative science and of philosophy as a branch of science. Short’s rich and original study shows us how to read Peirce’s writings and why they are worth reading.

In memoriam
George Raymond Geiger (1903–1988)
Frank Tannenbaum (1893–1969)
Sidney Hook (1902–1989)
Three of John Dewey's students who at turning points shaped my life
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What is, or ought to be, the relation of philosophy to science? The study of nature, if theoretical rather than descriptive or practical, was not distinguished from philosophy until after the advent of modern science. Since then, philosophy has defined itself largely by its relation to science. In the stock phrases, it has sometimes seen itself as the queen of the sciences, laying the foundations for scientific inquiry and/or fitting scientific conclusions to a grand system, and sometimes as its handmaiden, clarifying its methods and purpose. Instead of or in addition to either queen or handmaiden, philosophy has been conceived of as specializing in all the questions which the sciences do not address; sometimes, as with Kant, as drawing boundaries around science to make room for another mode of knowledge. If science is conceived of as factual in contradistinction to normative, then normative questions are left for philosophy, including normative questions about what science is good for and how it should be pursued. The American scientist and philosopher, Charles Sanders Peirce (1839–1914), had conceptions of science, philosophy, and their relation that fit none of the preceding categories.

Peirce drew his definition of science from the historical fact of modern science, but not from its initial methods and metaphysics. He defined science by its ‘spirit’ of untrammeled discovery. Science, then, is not limited to any method or metaphysics established a priori. Its methods and their metaphysical presuppositions are tested empirically by their fruitfulness or lack thereof in guiding inquiry. Indeed, Peirce argued that nineteenth-century developments in physics and biology introduced nonmechanistic modes of explanation. So also, the limits of science – the possible topics of factual inquiry – are discovered as empirical methods are tried and prove either to have or to lack interesting results. In these ways, the philosophy of science is internal to science: cognitive norms are a product of empirical inquiry.

But then the alleged dichotomy of fact and value is thrown into question. In that and in other ways, Peirce held that modern science, properly
understood, subverts the features of modernity – materialism, cynicism, and purposelessness – for which it has usually been blamed. But he also turned modernity’s restlessness to good account, on the model of science. Toward the end of his career, he proposed that all of philosophy should become a branch of empirical inquiry: not a body of doctrine a priori but part of the endless enterprise of discovery, including normative discovery. This is an alternative to prevailing conceptions of philosophy, one which it may prove salutary to consider.

That is one theme of this book. The second concerns the notorious difficulties of Peirce’s philosophical writings: their many contradictions and lacunae, which provide his exegetes so much frustrating labor and explain why philosophers who choose not to be specialists in Peirce find they must ignore him altogether. These seeming defects, I argue, acquire a different and more productive significance once it is perceived that Peirce wrote philosophy as a scientist, not as a philosopher in any of the usual senses. He made conjectures, extraordinarily bold, and developed them in some technical detail, first in one way and then in another not consistent with the first, and then again in third and fourth ways – all for the sake of trying them out, of pushing them as far as they can go, so as to find what works. Think of how the idea of atomism was developed over 2,000 years in such different, mutually incompatible ways, until finally it resulted in fruitful theories (chemistry and statistical mechanics): Peirce’s leading ideas were like that – expressed incompletely and inconsistently, never completely nor finally. Just as he understood science to be inquiry rather than knowledge, so also his aim in philosophy was to open up lines of inquiry, not to state final truths. To read Peirce either as a system builder or as an analytic philosopher avant la lettre, engaged primarily in conceptual analysis, is to miss his meaning and mistake his strengths for weaknesses.

Combining these themes results in a complex book, but its parts hang together and cannot be thoroughly developed in separation. At the same time, the focus is narrow: I am not attempting an overview of Peirce’s philosophical oeuvre nor even of all that he had to say about the methods of science. I shall, for example, touch only briefly on what he wrote about probability, statistical reasoning, and the three modes of inference that he distinguished; perhaps because these topics are technical, they have been relatively well treated in the literature. My aims, rather, are to establish Peirce’s unique conception of science, to modify the way in which his philosophical writings are read, and to argue for the relevance of those writings to contemporary philosophy – not by fitting in with current discussions but as suggesting an alternative to them.
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This book is addressed to anyone interested in philosophy and not to students of Peirce only: it presupposes some acquaintance with philosophy but no knowledge of Peirce’s writings. Although not written as an introduction to his thought, it may nonetheless serve as one entrance, among many, to the labyrinth.

... It may help to outline the chapters that follow, as they vary in kind yet are interdependent. Chapter 1 briefly reviews Peirce’s life in science, emphasizing the variety of his researches in mathematical logic, chemistry, astronomy, geodesy, experimental psychology, and the history of science. Chapter 2 discusses in depth his conception of science, difficult precisely because it is not technical but turns on the nebulous idea of a scientific ‘spirit’: one which eventually expressed itself in specialist research and is now embodied in the institutions that support that research. He reversed the usual deprecation of specialization, portraying it as exemplary devotion to a transcendent cause. Chapter 3 defends this conception of science against a pair of current, mutually antagonistic ideas of the difference of modern science from classical and medieval philosophy; Peirce saw that difference more subtly as one in which the classical ideal of knowing is transformed rather than abandoned. That revolution in cognitive aim occurred, it is argued, in consequence of empirical discoveries: thus the history of science reviewed in Chapter 3 provides evidence for the argument of Chapter 9, that there is normative knowledge and that it is empirical.

Chapters 4–6 cover much of what is usually included in accounts of Peirce’s philosophy, but their contrarian aim is to subvert the notion that he had ‘a philosophy’ in the usual sense. Chapter 4 examines what was most constant in his thought but constantly evolving: his early embrace of ‘scholastic realism’ deepened over time as did his so-called pragmatism. Eventually, he came to see that his 1878 ‘pragmatic’ rule for clarifying ideas presupposes a modal realism the meaning of which it cannot clarify; this led to that rule’s amendment in 1903. Chapters 5 and 6 examine mutually incompatible stages of Peirce’s idealism, stressing their exploratory character and unresolved problems. The formal structures projected in writings of 1867 and 1868–1869 (Chapter 5) were in later years retained somewhat modified but transformed in meaning. Most importantly, the orders of relation that proved illuminating in an 1867 essay were later reestablished on an entirely different basis, the ‘phenomenology’ described in Chapter 8. The cosmological speculations of the 1890s (Chapter 6) were fascinating but unsuccessful. In their context, however, Peirce saw that
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the nonmechanistic modes of explanation aforementioned reintroduced, with one basic change, Aristotle’s idea of what came to be named ‘final causation’. This nontheistic teleology explains the possibility of normative science, the topic of Chapter 9.

The part played by Peirce’s scientific work in the development of his philosophy has not heretofore been noticed. His measurements of small differences in the brightness of stars (their ‘magnitudes’) and in the force of the Earth’s gravity prompted psychological experiments and related studies probing the limits of perception. Chapter 7 argues that Peirce extended the scope of empiricism on empirical grounds, by making putative observations, finding that they agree, and finding that their agreement can be explained by what is putatively observed; in that way, what is at first putative becomes established as genuine. Thus a theme underlying all of this book: that there is no empirical knowledge without metaphysical presuppositions and that these are tested empirically by the success of the observations they permit. Peirce expanded empiricism in two directions, both surprising. Ranking stars by order of magnitude requires careful attention to one’s own sensations: interpersonal agreement in that ranking suggested the possibility of phenomenology – the observation and description of experience itself. And the impressionistic ranking of stars’ magnitudes became the model on which Peirce developed his idea of normative science.

In consequence of these discoveries, Peirce in the early 1900s framed a taxonomy of the sciences in which is included philosophy, identified as a number of empirical inquiries, of which the most basic is phenomenology. Chapter 8 states that taxonomy briefly, stressing its anti-foundationalist conception, and then presents the science of phenomenology – or phaneroscopy, as Peirce later renamed it – systematically. Phaneroscopy depends not only on empiricism’s expansion (Chapter 7) but also on a vocabulary of phaneroscopic description drawn from the algebra of relations, viz., the three orders of relation that had been discovered in 1867 to be illuminating (Chapter 5). This chapter concludes by illustrating the use of phaneroscopy in establishing the meaning, hence the meaningfulness, of metaphysical categories. That use was mandated by Peirce’s 1903 reformulation of pragmatism (Chapter 4).

Peirce’s concept of science entails that normative judgment in science, about which types of theory or explanation or evidence, etc., are good, must depend on the evidence provided by the experience of inquiring (Chapter 2), a thesis supported by the history of science (Chapter 3). This implies a method, at once empirical and normative, which his late
sketch of a trio of ‘normative sciences’ generalizes and rationalizes. Its generalization is supported by the expansion of empiricism (Chapter 7) and its rationalization depends on the rediscovery of final causation (Chapter 6). On Peirce’s account of them, however, the three strands of normative inquiry abstractly portrayed cannot in practice be disentangled from ongoing experience. Thus, they cannot have been intended to be new specializations. The importance of his idea is, rather, that its plausibility undermines that most pernicious of dichotomies, of fact and value. Chapter 9 explicates Peirce’s idea of normative science, traces its method through Schiller’s aesthetics to Kant (surprisingly), and suggests that the rediscovery of final causation corrects what is most problematic in Kant’s metaphysics of morals, viz., its anti-naturalism.

The brief concluding chapter (Chapter 10) summarizes the preceding as an ironic opposition of modern science to modernity.
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A Note on Citation of Sources

I employ the usual abbreviations in citing Peirce’s writings: those of the form n.m are to paragraph m of volume n of the *Collected Papers*, while those of the forms Wn:m are to page m of volume n of the *Writings*, EPn:m to page m of volume n of *The Essential Peirce*, RLT:n to page n of *Reasoning and the Logic of Things*, PM:n to page n of *Philosophy of Mathematics: Selected Writings*, and Rn to unpublished manuscript n, as numbered in Richard Robin’s catalogue (Robin 1967). The Bibliography contains more information about these editions. Whenever possible, I will cite EP instead of other editions, as that is the source most readily available to most readers. Other references, as that to Robin just made, are by author and date, as listed in the Bibliography. An exception is made for citations of classical works, for example, those by Aristotle, Descartes, Hume, and Kant. In their case, I use standard forms of citation that will enable the reader to locate the passage cited in any good edition or translation. That is more useful than citing a page number to a particular edition, and therefore I have listed no such editions in the Bibliography. I cite particular editions of these classic works only when quoting a translation, and those translations are listed in the Bibliography.