

# The Conservative Pragmatism of Charles Peirce

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## I

PHILOSOPHY DOES NOT have a nationality, but nations have made distinctive contributions to philosophy. We speak of French rationalism (though neither Spinoza nor Leibniz was French), for example, or of British empiricism. America's distinctive contribution is usually supposed to be pragmatism, an outlook all too easily associated with the most degenerate forms of an alleged American "practicality." It suggests a disdain of knowledge pursued for its own sake. In place of understanding, it seems to urge the application of intelligence to "solving problems" or to "making life better." Social engineering and social experimentation thus appear to be sanctioned by a philosophy thought to be distinctively American.

That ignores the Founders' conservatism, embodied in our Constitution. But our constitutional philosophy, though it structures the daily life we lead and is therefore more deeply rooted than any thinker's paper philosophy, lacks the *cachet* that, in certain quarters, an intellectual "movement" has. Those quarters and that *cachet* may not warrant our very high

regard, but the unfortunate fact is that they have a large influence on those who, in turn, shape public opinion.

As witness to that conclusion, I call upon none other than Richard Rorty, who has been very busy, of late, in inventing an indigenous American legacy for radicalism.<sup>1</sup> That is no more than a rhetorical ploy, but one that is potentially effective. It is a matter of adjusting the stage lighting. In place of the dark clouds of discredited Marxism swirling out from Europe, Rorty proposes a genial, open-air, sun-lit American radicalism, led by John Dewey, typical Yankee. Rorty makes Dewey to be our most pragmatic pragmatist and, as such, a philosopher on a level with Heidegger and Wittgenstein. There's the *cachet*. Rorty makes it possible for a radical to claim a deep philosophy and, at the same time, to disarm his critics: "There's nothing subversive here—why, radicalism is as American as apple pie!"

Richard Weaver wrote that ideas have consequences; what we learned in the 1960s is that bad ideas, if uncontested, most definitely do have consequences—very bad ones. I propose, therefore, to make a few corrective comments on the received view of pragmatism. Let me begin with that about which all will agree.

## II

Pragmatism is, indeed, the one major

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philosophical movement to have originated in the New World; all the others, barring the religious philosophies of India and East Asia, originated in Europe. The idea and the name are due to Charles Sanders Peirce (pronounced "purse," 1839-1914), who introduced both in conversations with a small group of young men, including William James and Oliver Wendell Holmes, Jr., in Cambridge, Massachusetts in the early 1870s. Later, in 1878, Peirce published the idea but not the name in an essay, "How to Make Our Ideas Clear." It was not until 1898 that William James, in a lecture, first introduced the name, "pragmatism" to the public and made pragmatism famous; in that lecture, and always thereafter, he attributed the idea and the name to Peirce.

That idea, like those of rationalism and empiricism, belongs, at least at first glance, to the theory of knowledge rather than to metaphysics or ethics. The rationalists supposed that the mark of truth is its conformity to human reason, the "light of nature" within us. If an idea is clear and distinct, then we can be—rather, we are—certain of its truth. There is no deeper or further test by which a clear and distinct idea could be shown to be false. The empiricists shifted emphasis from truth to meaning. According to Locke, Berkeley, and Hume, an idea has no meaning except so far as it derives from experience, whether "outer" sense experience or "inner" experience of our own mental acts and states. As a meaningless idea exists in words alone, there is also a tacit shift of emphasis from thought to language. By this means, the empiricists could reject rationalist claims, not as false but as meaningless.

But the empiricists faced a number of problems, and it is these which led, *via* Kant, to pragmatism. As experiences, inner or outer, are always of particulars, the empiricists had trouble accounting for general ideas. And since the content of experience—even "outer" experience—

is, in their view, always "inner," they had trouble accounting for ideas of a world external to the mind. Even one's own body seemed to be no more than a congeries of episodes in his mind. What is worse, other minds are external to one's own and, thus, it is nonsense for anyone to suppose there is any other mind than his own; attempts to evade this lonely conclusion were not convincing. Equally, they had trouble accounting for our knowledge of laws of nature. Those laws are general but we observe particular events only; a regularity in the latter proves nothing about the future. That's Hume's infamous problem of induction.

Peirce made practical applicability the condition of clarity of meaning, and he made successful application the (never complete) test of truth.<sup>2</sup> In a moment, we shall see how this is intended to solve empiricism's unsolved problems. First, however, I should like to point out that the doctrine is not so narrow as it may seem to be. Peirce himself liked to associate it with Christ's dictum, "By their fruits ye shall know them." In any case, it does not entail that application is the goal of knowledge. We can seek truths for the sake of their applications or, as in experimental science, we can seek applications, even intrinsically trivial or useless ones, for the sake of testing theories and, thus, arriving at truths.

Applying an idea involves action, a direct engagement of one's body with the physical or biological world surrounding it, as in an experimentalist's manipulation of instruments in his laboratory. Thus, pragmatic meaning implicates the physical and physiological *ab initio*. In the same way, it implicates generality, especially the generality of law. For an action consists in a continuity of motion, through space and time, for an effect; hence, it presupposes physiological and other laws, by which it is carried out and by which its effect is achieved. None of this is any proof that there is a law-governed

physical world; but it does controvert the empiricist implication that such a world is inconceivable—that talk of it is, literally, non-sense. On the contrary, there is no sense without a law-governed world being implied. Furthermore, since the world revealed in action is revealed as transcending the immediate contents of sense experience, we do not identify it with its perceived effects, any more than Christ meant to identify true prophets and false prophets with the respective fruits of their teachings. Truth transcends the signs by which it is known.

We act, not only as organisms in a physical world, but also with other persons and by means of instruments given us by other persons; among those instruments, language takes first place, along with the depths of tacit knowledge from which language cannot be separated. The very ideas we wish to apply and test in action are formulated in words others have taught us. Thus, other minds, and society in general, are also implicated *ab initio* in pragmatic meaning. Again, there is no proof in this of anything's reality. Rather, it shows that our cognitive lives unfold through continual acts of faith—faith in our physical prowess and organs of sense, in the wisdom of our elders, and in there being a world of some knowable but largely unknown character. By acting on this faith, we make some limited progress toward knowledge; we believe in order that we may know.

And that brings us to what is perhaps most characteristic and most dangerous in pragmatism: its being future-oriented. Rationalism and empiricism, alike, seek the foundation of truth in the origin of ideas, rational or experiential. Pragmatism allows ideas to have any origin; what matters is not where we got an idea from but where we can go with it. In the case of science (and it will shortly become clear why I am emphasizing science), the usefulness of an idea has two dimensions: reliability and fruitfulness. By “fruitful-

ness” I do not mean practical utility but, rather, the opening up of further lines of successful research—a purely intellectual value. As reliability is to truth, so fruitfulness is to depth and breadth of understanding. The test of truth and fruitfulness lies in the future. It depends on our developing the implications of ideas so that we can find ways of applying them experimentally.

Now, our possession of language and other means of representation gives us a power to construct boldly imaginative theories. These will usually be mistaken. Progress in science depends on the boldness of those ideas, even when mistaken. For the road to truth is through the elimination of error. The boldest ideas are the ones that are most quickly and economically eliminated if false, as well as most fruitful if true. Thus pragmatism shifted the emphasis from intellectual security to intellectual progress: risk of error in the short run is accepted for the sake of capturing more of the truth in the long run.

The danger is plain: a premium is put on progress and on radical innovation as the means to progress. It is in this connection that I would like to make the first of three points about the conservatism of pragmatism's founding father, Charles Peirce.

### III

Peirce, who was a practicing scientist as well as a major figure in the development of mathematical logic, was primarily concerned with science (which he saw in ethical and religious terms) and its methods. He had no express political philosophy. But when William James invited him to deliver some lectures on “topics of vital importance,” he responded, with characteristic graciousness, by lecturing on why he had nothing of any value to say about such topics. And the reason he gave was classically conservative. Like Aristotle and Burke before him, Peirce

distinguished theory from practice and argued that the intellectual attitude appropriate to theoretical inquiry is disastrous if applied to practical questions, or at least to great issues of vital importance. The one requires radical thinking and reliance on one's own powers of ratiocination, the other best relies on instinct, sentiment, and tradition, or, in short, the accumulated experience of countless generations.

"In great decisions, I do not believe it is safe to trust to individual reason. In everyday business, reasoning is tolerably successful; but I am inclined to think it is done as well without the aid of theory [*i.e.*, logical theory, a *logica docens*] as with it. A *logica utens*, like the analytical mechanics resident in the billiard player's nerves, best fulfills familiar uses."<sup>3</sup> As to questions of vital importance, Peirce wrote, for example, in this way: "The regnant system of sexual rules is an instinctive or sentimental induction summarizing the experience of our race. That it is abstractly and absolutely infallible we do not pretend; but that it is practically infallible for the individual...in that he ought to obey it and not his individual reason, that we do maintain."<sup>4</sup> Again, "...the man who would allow his religious life to be wounded by any sudden acceptance of a philosophy of religion...is a man whom we should consider *unwise*."<sup>5</sup> Peirce was, furthermore, explicit about this being a conservative doctrine: "...true conservatism, I say, means not trusting to reasonings about questions of vital importance but rather to hereditary instincts and traditional sentiments."<sup>6</sup> "The opinion prevalent among radicals that conservatives, and sentimentalists generally, are fools is only a cropping-out of the tendency of men to conceited exaggeration of their reasoning powers."<sup>7</sup>

In his character as a philosopher and man of science—that is, as devoted to advancing theoretical knowledge—Peirce offered several theoretical argu-

ments for the unreliability of theory and the deceitfulness of reason in application to vital questions. For example, on Darwinian grounds, he suggested that, if "the faculty of reasoning" were "of the first importance to success in life," then "natural selection would [have] operate[d] to breed the race for vigorous reasoning powers," whereas, "comparatively few persons are originally possessed of any but the feeblest modicum of this talent."<sup>8</sup> Perhaps more seriously, he asserted that reason itself dictates "the supremacy of sentiment in human affairs."<sup>9</sup> The argument he proceeded to give is too brief as well as over-stated, but the basic idea follows from analyses of scientific inquiry he developed with more care elsewhere, as summarized above. It comes down to this: the strategies that make sense when the aim is advancing knowledge in the long run—the price of which is error in the short run—are not justified for making vital decisions. For those decisions must be made for the short run. The short run is where we live.<sup>10</sup>

It is, then, his vision of the essential radicalness of science that forced Peirce to distinguish practical wisdom from theoretical knowledge, and prudence from ratiocination. If he was a conservative with regard to life, that is because he was a radical with regard to theory. John Dewey, who was a student of Peirce's during the brief period in which the latter taught logic at Johns Hopkins, failed to see how the one leads to the other, and thus we find Dewey urging an experimentalist approach to social and political questions. This "progressivism," however, is not an inevitable corollary of pragmatism; it may even be a demonstrably fallacious inference from that doctrine. If Peirce was right, it is.

#### IV

In addition to his classically conservative distinction between theory and practice, Peirce held a classically conserva-

tive view of the individual's dependence on society. That view follows from the metaphysics presupposed by his pragmatic account of clarity of meaning. As it is presupposed, that metaphysics had to be founded on other grounds; thus, in his middle years, Peirce developed a phenomenological analysis of experience that issued in a set of categories interpretable metaphysically. That was a little before Husserl began his entirely independent and quite different work. Both adopted the word "phenomenology" from Hegel; unlike Husserl, Peirce based his analysis on the logic of relations, one of the areas of formal logic to which he had made a major contribution. However, it would be impossible in these pages to expound Peirce's phenomenology systematically; a few of its theses will suffice for our purpose.

As we noted above, on the pragmatic analysis of meaning, physical realism, the reality of general laws, and the existence of other persons are implicated in our most basic ideas and experiences. The pragmatic concept of experience, thus, is not so narrow as is the empiricists', including, one must add, their twentieth-century heirs, the logical positivists and logical empiricists. Empiricists think of experience, essentially, as passive, hints to the contrary (e.g., Hume's talk of the "force and vivacity" which distinguishes impressions from the ideas copied from them) notwithstanding. And they think of experiences as wholly contained within individual consciousness. Peirce developed his phenomenology and metaphysics in express opposition to positivism.

Experience, Peirce showed, is not at all like the empiricists' account of it. In the first place, its contents are not momentary and episodic but are extensive in time as well as in space: what we call the present moment is a continuous flow, within which a disappearing past and an aborning future are both contained. But a continuum, of any type, is undivided

though everywhere divisible, and thus it exhibits unactualized possibilities. That there are unactualized possibilities entails Peirce's concept of a law, as pertaining to what would have been (had conditions been different) and could be (were certain conditions actualized), as well as to what was, is, and will be. For the positivists, by contrast, a law can be nothing more than a regularity that happens to obtain among the events that actually occur.

In the second place, experience is not passive but incorporates a sense of effort made against a resistance or a sense of resistance made to an opposing force. That sense is bipolar: one cannot have it without feeling oneself to be at one pole of a relation of which there is another pole. The sense of "self" and the sense of "other" are inextricably paired; both are parts of one and the same experience. As mentioned before about Peirce's analysis of meaning, this aspect of experience does not prove anything about what exists; but it does give content to the concept of an existence external to oneself, making an argument for it possible.

Similarly, the experience of lawfulness does not prove that anything is lawful. However, as it provides a concept of lawfulness beyond mere regularity, it makes it possible to argue that an extended regularity is no coincidence but must be due to law. And that grounds an expectation of future regularity. (The argument, if developed, requires an application of probability theory to inductive reasoning. Such an application was one of Peirce's many technical innovations of marked originality, but it lies outside the scope of the present essay.)

Third and last, experience is not solipsistic. It is a fact of life that experiences can be shared, however imperfectly. Touch is the basic form of human communication because, in it, two people have the same bipolar experience, albeit at opposite poles: it is one feeling felt by

two. Beyond that secure base, sharing becomes progressively more problematic, but language and society presuppose some commonalities of sensation and emotion. Phenomenology itself rests on a capacity by which one person can use words to direct another person to aspects of experience common to all. Furthermore, the experiencing subject is already a self who has been formed in society. Peirce often remarked that we first become aware of ourselves in being corrected by others (most of all, in learning to speak), so that one conceives of oneself, in part, as the locus of ignorance and error. Only so, can we even raise the question whether our experiences are illusory. But this means that we see ourselves, essentially, as members of a society, and that we see society as having moral and epistemological authority, at least up to a point.

Peirce's concept of law as irreducible to its actual instances enabled him to view a society as more than the sum of its members. We may frame our laws, but they shape us. For example, the social division of labor makes types of occupation and, consequently, types of person possible that could not otherwise exist. More fundamentally, without the language he has learned from others, he could not represent himself to himself nor, hence, come to self-consciousness. The individual human lacks a self and a personal existence independent of the society in which his ego was formed. Our "second nature," and better nature, that distinguishes us from the beasts, is a social product. But, like pragmatism, this doctrine is easily distorted. It can be made to seem a permission for treating persons as units that may be sacrificed for "the general good." It can also be made to seem an argument for the plasticity of human nature, a clay to be shaped by social engineers; one thinks again of John Dewey. In fact, neither conclusion follows.

Take plasticity first. That societies

shape their members is consistent with there being narrow limits within which shaping is possible, not to mention desirable. But if, as indicated above, social existence is presupposed in inquiry, then the nature of that existence can remain dark even while it enables us to shed light on other matters. It follows that we may know much without understanding ourselves, and without knowing all the ways in which our nature is conditioned by social arrangements. Change, and the necessity to meet changes of circumstance by changes in social arrangements, are of course constants of life; but the social nature of the self argues for piecemeal, local changes, guided as much as possible by experience, and against grand plans for global change reasoned out by an elite few. The very dependence of self on society argues caution in changing society—especially if our understanding of that dependence is imperfect.

Next, let us consider the question whether the individual is, in relation to his society, means or end. That there is no self without society, does not decide the question either way. But if we look more closely at the nature of the selfhood which social existence makes possible, we may obtain some clarity. In this connection, Peirce's reflections on the scientific community, and the relation of the individual scientist to it, are particularly illuminating, precisely because they go so far in the direction of subordination of self to society as to reveal why we cannot go all the way in that direction—why, indeed, society itself depends on that personal liberty which it alone makes possible.

Peirce's concept of science was remarkable, especially in his day but even in ours, for its emphases on the long run, the vulnerability of theory to fundamental revolutions, the social nature of inquiry, and the evolution of science's aim and its methods. These several emphases hang together and add up to the moral, even religious or quasi-religious, view that

Peirce took of the life of inquiry. For example, since truth in scientific inquiry can only be expected in the long run and since, indeed, it is a theory's being sustained in the long run of rigorous testing that is its proof of truth, Peirce concluded that no one can reasonably engage in scientific inquiry without relinquishing egoism; for all of his efforts make sense only in relation to a goal that he himself will not live to see achieved. The very validity of his inferences consists in their fitness to contribute to that eventual goal. This applies especially to those inductive generalizations that, more often than not, lead us into error in the short run but that provide bases for further inquiry, in which their own limitations will be exposed and corrected. Already at age 30, Peirce wrote, with a penchant for rhetorical overkill that, regrettably, he never lost, "He who would not sacrifice his own soul to save the whole world, is illogical in all his inferences, collectively. So the social principle is rooted intrinsically in logic."<sup>11</sup>

Despite the "complete self-identification of one's own interests with those of the community"<sup>12</sup> thus demanded of the scientist, that same scientist is required by that same community, in those same interests, to think for himself. The education of the scientist, in the existing body of knowledge and theory and in the best methods discovered so far, is all for the sake of enabling him to make advances of his own, different from those that have already been made and perhaps in contradiction to some of them. In a word, his education frees him.

Peirce's identification of truth with that which inquirers will agree upon ultimately, if they pursue their inquiries indefinitely, has often been misunderstood as an identification of truth with social consensus. That appeals especially to our leftist brethren, who feel themselves to be in charge of consensus, at the moment, at least on university campuses.

But all such forms of authority are precisely what Peirce rejected as inimical to scientific inquiry. The only agreement that counts as a mark of truth is uncoerced agreement, indeed, *unintended* agreement—agreement uninfluenced by what one another thinks.

Peirce identified freedom with self-control, and he identified the highest level of self-control with control over our own principles of conduct. But the latter depends on our having a language in which to represent our modes of conduct to ourselves, so that they may be compared to the ideal, and, thus, deliberately altered if found wanting. Freedom of the individual, arguably, is a society's highest achievement. Arguably, the other ends of social life cannot be achieved except through actions freely performed. The life of science, as described by Peirce, illustrates the point. How that point would be otherwise illustrated in other forms of social existence brings us back to the distinction between theory and practice.

It may seem paradoxical that the same philosophy that describes the individual as the locus of ignorance and error also makes that individual to be the end for the sake of which a society exists. It may seem paradoxical that the same philosophy that attributes moral and epistemological authority to society also holds that the proper use of that authority is to free the individual to act on his own and to think for himself. But those are the sorts of paradoxes that have always put conservatism somewhat beyond the ken of radical thinkers.

## V

The third and last respect in which I want to argue that Peirce's philosophy is conservative is epistemological, or perhaps I should say, anti-epistemological. We began by noting that pragmatism, like rationalism and empiricism, belongs to the theory of knowledge, or epistemology. The defining character of modern phi-

osophy is its insistence on beginning with a theory of knowledge: everything else must be held in doubt—or swept cleanly off the board—until we have first figured out how we can know anything and by what marks we can identify true knowledge. The epistemological project, thus, is to lay solid foundations on which the edifice of knowledge can be reconstructed securely and purged of error. Radicalism has its root, too, and that epistemological project is it. Ancient and Medieval philosophers had their theories of knowledge, but they did not begin with those theories; on the contrary, their accounts of knowledge were grounded in metaphysics and in the philosophy of nature, *i.e.*, the natural science of their day.

In the seventh decade of the recent century, the late W.V.O. Quine reversed the modern tendency, and announced a “naturalized epistemology,” in which the idea of a fresh start on solid grounds, or of any pristine beginning, would be scrapped.<sup>13</sup> The question of knowledge, its sources and its scope, was to be addressed on the basis of what we already know or, at least, on the basis of what we think we know. Unfortunately, Quine defined this new (old) enterprise narrowly. He assumed that the aim of science is to establish theories having predictive power and that the only questions are, “How is that possible?” and “How may we best exploit sensory experience to arrive at such theories?” Thus, the natural sciences on which naturalized epistemology draws would be physics and physiology primarily. Quine reduced all questions of value in science to engineering questions of the best means to the end already stated.<sup>14</sup> But that ignores the rather obvious fact that, in the long history of human inquiry, the aim of science has evolved—most dramatically, when Aristotle’s qualitative, taxonomic, and teleological mode of explanation was supplanted by Galileo’s quantitative, predictive, and mechanistic mode. Quine

appears to have been ducking all the important, *i.e.*, the normative, questions.

Fortunately, Peirce initiated a much less restricted form of this approach, roughly a century before Quine. He was, thus, the first to knock epistemology off its modern throne, and to return to the ancient and medieval practice of trying to understand knowledge in terms of what we know, rather than from a position of pretended ignorance. And if, in my preceding discussion, it has seemed at many points that important issues were being begged, I suggest that that was due less to the exigencies of exposition in small space than to the modern presumption (to which I fear the reader may be as habituated as am I) that nothing factual should be assumed when the grounds of factual knowledge are the topic. In any case, we have seen that Peirce mentioned not only the physical and physiological roots of knowledge but also its social roots. And we have seen, as well, that he made much of the values that must inform inquiry, especially scientific inquiry, even to the point of supposing that science requires something like a conversion experience, in which one regains one’s self by giving it up to something larger. But that is only the beginning.

For Peirce also wrote that “each chief step in science has been a lesson in logic,”<sup>15</sup> by which he meant, I believe, a lesson not only in scientific method but also in the end to which that method is the means. For he knew that which Quine ignored, that the ideal of understanding has evolved over the history of inquiry. That the true aim of inquiry is discovered in the process of attempting to achieve it, however, makes no sense unless an aim is capable of being discovered: which means that it must exist before being discovered. This, again, goes against the modern grain, which assumes that all values are subjective, that none exists independently of individuals’ arbitrary choices. Indeed, we are told that that is what mod-

ern science teaches us. Peirce, however, argued that developments in nineteenth-century science tacitly reintroduced something like Aristotelian (non-theistic) teleology, *viz.*, the doctrine that there are ends in nature. As he put it, "...it is the idea which will create its defenders, and render them powerful."<sup>16</sup>

Peirce's teleology is another topic into which we cannot here enter, but its introduction illustrates where the rejection of epistemology's pretensions has gotten us. By beginning with knowledge, rather than from ignorance, we have—another paradox!—darkened the canvas. It was an anti-Enlightenment move. For it means that an ability to make sense out of science, and to defend its claim to objectivity, is hostage to the theories which science itself provides us. As those theories change, so will our understanding of scientific method change, sometimes making it seem more mysterious or problematic (think of quantum mechanics and what it seems to imply about the relation of observer to observed), sometimes less so. It is a bit of luck, if Peirce was right, that science has reintroduced teleology. For without teleology, its own claim to objec-

tivity would be greatly circumscribed: the values that inform inquiry—the very goal to which science requires us to subordinate our personal ambitions—would seem, incoherently, a preference merely subjective.

That bit of luck aside, the thrust of Peirce's theory is to invert the purpose of epistemology, from assuring us that all henceforth will be plain-sailing, to exposing the greatness of our ignorance and our deep dependence on faith. For all of its stupendous achievements, modern science casts but little light on its own grounds, its own prospects and limitations. It is like a candle set adrift in the dark on a vast sea: it reveals very little of what supports it. Peirce's theory of knowledge teaches humility.

As such, it opposes equally the dogmatic certainty of old-time rationalist reformers and their superficially opposite "postmodern" descendants, who deny that there is any truth to be known. The latter merely take a shorter road to tyranny, since they recognize no need to justify their choices. To the one, we say, "We do not know"; to the other we say, "There is something that we do not know."

1. Rorty's inventing began in 1979, with the publication of his *Philosophy and the Mirror of Nature* (Princeton, N.J.), and proceeded through several subsequent volumes; his 1998 book, *Achieving Our Country: Leftist Thought in Twentieth-Century America* (Cambridge, Mass.) merely makes the agenda more explicit. More recently, Louis Menand has echoed Rorty—without citing him—in his superficial and incoherent but beguilingly written and well-received book, *The Metaphysical Club* (Farrar, Strauss & Giroux, 2001). 2. I shall be summarizing and glossing such a large body of Peirce's writings, that citation of sources, except for direct quotes, is impracticable. However, most of what I draw upon may be found in Volumes I and V of the eight-volume *Collected Papers of Charles Sanders Peirce*, Hartshorne, Weiss, and Burks, eds. (Cambridge, Mass., 1931-1958), or in

the more recent, two-volume edition, *The Essential Peirce*, edited by the Peirce Edition Project (Bloomington, Ind., 1992-1998). Citations to the former will be in the form, 1.2, to volume 1 and paragraph 2, those to the latter will be in the form *EP1:2*, to Vol. 1, p. 2. 3. 1.623, *EP2:30*. 4. 1.633, *EP2:32*. 5. 1.633, *EP2:32*. 6. 1.661. 7. 1.662. 8. 1.657. 9. 1.634, *EP2:32*. 10. In addition to the difference in length of run, we should also mention that scientific reasoning requires a type of abstraction that is exactly wrong when addressing issues of vital importance. That this second point is implicit in Peirce's discussion is less obvious than I could wish. 11. 5.354, *EP1:81*. 12. 5.356, *EP1:81*. 13. Quine, *Ontological Relativity and Other Essays* (New York, 1969), Chapter 3. 14. Quine, *Pursuit of Truth* (Cambridge, Mass., 1990), §8. 15. 5.363, *EP1:111*. 16. 1.217, *EP2:122*.