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## Conjectures concerning an uncertain faculty claimed for humans

VINCENT COLAPIETRO

### 1. Introduction: Experimentalism versus deductivism

C. S. Peirce worked tirelessly toward transforming philosophical discourse into one in which the traditional ideal of demonstrative proof would be eclipsed by an alternative model of rational persuasion. His efforts marked a decisive break with deductivism and a thoroughgoing commitment to experimentalism. The Peircean model of rational persuasion is derived from an idealization of the procedures by which experimentalists seek to establish the provisional truths of their communal investigations.

This bears directly upon his theory of signs, in at least two ways. First, Peirce's theory of signs was self-consciously the work of an experimentalist.<sup>1</sup> Second, this theory was crafted principally for the purpose of providing the resources for offering a compelling account of experimental inquiry (see, e.g., Colapietro 1987, 1997a). In designing a theory for this goal, Peirce provided the resources for much more than an account of such inquiry. Arguably, he bequeathed to us nothing less than the means by which not only human practices in their myriad forms but also natural processes in their own protean guises are to be described and analyzed. Whether this is so or not, it is clearly the case that Peirce's theory of signs is, at once, the work of an experimentalist and a work designed for an understanding of how experimentalists ought to comport themselves in the context of inquiry.

Peirce conjectured that humans possess an innate capacity or 'faculty of divining the ways of Nature' (CP 5.173). 'To give the lie to his own consciousness of divining the reasons of phenomena would be as silly in a man as it would be in a fledgling bird to refuse to trust its wings, and leave the nest.' But is it a fact that man possesses this magical faculty? (CP 6.476). From Peirce's perspective, it is a supposition not only worthy of serious, sustained scrutiny but also supported by numerous, intertwined threads of evidence (cf. CP 5.365). That is, it is a provisional fact



'conceptions of deliberate conduct.' He defines deliberate conduct as 'self-controlled conduct,' emphasizing 'control may itself be controlled, criticism itself subjected to criticism.' Ideally, 'there is no obvious definite limit to the sequence'; practically, however, it is worse than useless to try pushing self-criticism or self-control beyond reasonable limits.<sup>7</sup>

In Peirce's description of experimentation, then, the hypothesis of *reality* is joined to that of not only *selfhood* (the hypothesis of the self as a locus of ignorance and error) but also the hypothesis of *agency* (that of competent actors capable of deliberately modifying at least some of their intellectual habits). In 'What Pragmatism Is' Peirce is, implicitly, engaged in rescuing thought from the Cartesian privacy (Kenny 1968) in which it has been imprisoned for much of the modern period: 'There is no reason why "thought" . . . should be taken in that narrow sense in which silence and darkness are favorable to thought. It should rather be understood as covering all rational life, so that an experiment shall be an operation of thought' (CP 5.420; emphasis added). Indeed, there are strong reasons for trusting thought outdoors, for taking it to be evident in the outward actions and even hesitations of embodied agents.

An experiment can be viewed as an operation of thought because thought can be conceived as a process of semiosis occurring (at least) as often in the publicly observable domain of natural processes (including human actions) as in the publicly inaccessible realm of someone's individual consciousness. An experiment is a conversation in which the topic being discussed is, by various contrivances, afforded the opportunity to speak back, to object to the ways it is being spoken about. This means that the object being investigated becomes, in effect, an interlocutor: effective experimentation involves endowing apparently 'mute objects, brute things' (Bakhtin, 351; emphasis deleted) with a critical voice, a differential presence. For such a dialogue to take place, for experimentation to be able to transform mute objects into critical interlocutors, at least three suppositions (or hypotheses) are necessary. We must suppose that reality can be other than our representations of it. We must also suppose that human experimenters are rational subjects whose unique individuality is largely of a private character (individuals, so far as they are anything apart from others, and apart from what they and the others with whom their lives are so intimately and inescapably bound up, are mere negations [CP 5.317]). Finally, we must suppose that human beings are autonomous agents who can exercise an indeterminable measure of effective control over their future conduct.

Apart from these suppositions, experimentation makes no sense. Of even greater moment, experience itself would make no sense. We can and do learn from experience, but only because experience does not

simply befall us. Our recognition of the coercive dimension of human experience should not prompt us to overlook the immanent rationality discernible within any experiential continuum (be this continuum taken as that coextensive with an individual's life or a community's history<sup>8</sup>). The shape and direction of our experience is due, in no small measure, to our passions and ideals, habits and methods. We learn from experience because of what we, consciously or otherwise, ask of both it and our selves. What we ask and often demand of experience and our selves is either focused on or (at least) informed by the hypotheses structuring our expectations and, hence, orienting our agency.

The upshot of these considerations is that Peirce's theory of signs is truly representative of his cast of mind. More importantly, this theory is of a piece with his preoccupation with experimentation. Writing about himself, Peirce makes clear how he envisions the cast of his own mind: his disposition is to think of everything just as everything is thought of in the laboratory, that is, as a question of experimentation' (CP 5.411). Whatever assertion you address to an experimentalist, 'he will either understand as meaning that if a given prescription for an experiment ever can be and ever is carried out in act, an experience of a certain description will result, or else he will see no sense in what you say' (CP 5.411; emphasis added).

To the experimentalist mind, the possibility of error is ubiquitous, the reliance on imagination is unavoidable, and the painstaking, detailed correction of mistakes is the only reliable way of approximating the truth. For such a mind, a sign is anything by which we might be misled (Colapietro 1997a, 271–75; cf. Eco 1976: 7). But signs are also the only things on which we can rely for the purpose of augmenting our knowledge or enhancing our understanding. Peirce's preoccupation with the play of signs concerns the game of guessing (otherwise known as the work of science or, if this word carries too institutionalized and formal a meaning, experimentalism).<sup>9</sup> This is a game in which participants compete to make, as speedily and effectively as possible, the most illuminating mistakes. Experimentation transforms for certain purposes the willy-nilly course of lived experience into a (more or less) charted labyrinth of contrived experiences, thereby courting what experience so haphazardly yet so forcefully provides — emphatic negations of our animating expectations.<sup>10</sup>

### 3. Illuminating contrasts

I began by noting Peirce's efforts to transform philosophical discourse into a quite different affair than that of the dominant tradition in Western

philosophy, a transformation bearing directly upon his theorizing about signs. Baruch Spinoza might seem to be unique only in the thoroughgoing and explicit manner in which he proposed to compose philosophy *more geometrico*. But this would certainly be an extremely misleading exaggeration, for the ideal of geometrical demonstration did not hold such absolute sway over the theoretical imagination of Western thinkers as this claim implies. Even so, the ideal of stricter demonstrative (or deductive) proof tends to be the paradigm of human knowledge. Although the most effective ways of knowing abandoned this largely unattained ideal, the most influential theories of knowledge tended to cling to the deductivist paradigm.

Peirce was one of the first philosophers to see clearly just how radically we must revise our understanding of knowledge in light of the historical emergence of experimental inquiry.<sup>11</sup> In making experimentation central to his account of knowing, he placed abduction<sup>12</sup> (or the framing of hypotheses) at the innermost center of any convincing theory of human knowledge. His approach to knowledge of course cannot be appreciated in isolation from its rivals. It is, accordingly, instructive to view it in contrast to the approach of the predecessor from whom Peirce took such pains to distance himself and also that of a successor to whom Peirce is often compared.

Indeed, we began to appreciate the nature and extent of Peirce's innovation when they are juxtaposed to the project of that predecessor who has been traditionally accorded the honor of breaking with the classical tradition and ushering in the modern epoch. Such a juxtaposition is warranted by Peirce's own example, for at the outset of his authorship he deliberately broke with that thinker who so aggressively broke with the intellectual traditions of the medieval schoolmen.

Despite his undeniable role in redirecting scientific investigation along an experimental path, René Descartes clung to the classical ideal of demonstrative argumentation, by which necessarily true conclusions are *deduced* from apodictically certain premises. On his view, intuition alone insures the truth of the premises and the necessity of each step in a chain of inferences. Inference (and, in this context, inference can only mean deduction) is itself a series of intuitions. The foundations on which the edifice of knowledge is erected are secured by intuitions. This edifice itself, the result of the same cognitive acts as those by which secure foundations have been laid and, prior to this, traditional dwellings have been razed. More precisely, the (allegedly) indubitable foundations of human knowledge and all else are secured by the deductive intellect having recourse to nothing other than intuitive judgments. To be sure, the deductive intellect is only in the position to accomplish this momentous task after

having subjected itself to the severe discipline of methodic doubt. But, having subjected itself to this discipline, such an intellect can intuitively distinguish between genuine and spurious intuitions; furthermore, it can suspend judgment in the face of spurious yet enticing intuitions, refusing to grant them even the title of provisional or probable truths; and, finally, it can move deliberately, methodically, from one intuited truth to another in such a manner that the possibility of error is precluded. Immediate, infallible cognition allows the disciplined deductive intellect to accomplish each one of these tasks. Consequently, all knowing is, for Descartes, based on intuition not in the contemporary sense of a vague hunch but in the technical Cartesian sense of immediate, infallible knowledge.

To a degree seldom appreciated, Peirce's critique of Descartes' intuitionism and foundationalism is tied to his espousal of fallibilism. At least on Peirce's reading, Descartes' intuitionism entails infallibilism. Peirce's semiotic account of human knowing is intended to avoid the extremes of infallibilism (or absolutism) and skepticism. It is a theory of knowing that takes as its paradigm the practices of those who renounce every authority but that of experience and, moreover, who deny any immediate access to even the contents of their own consciousness or the disclosures of their experience. But Peirce's insistence that all knowledge is mediate, even our most effortless, spontaneous acts of recognition and perception, does not imprison us in the circle of our own private cognitions or the sphere of purely mental signs. It renders all of our efforts to know anything whatsoever, including our own thoughts, feelings, and desires, fallible, not impossible. The distance between Peircean fallibilism and thoroughgoing skepticism is as great as that between those who continue to hope to find a sustaining fulfillment in their individual lives and those who utterly despair of this possibility.<sup>13</sup> Skepticism (not the healthy questioning characteristic of the experimental mind but the thoroughgoing rejection of the very possibility of knowledge in even the modest, fallibilist sense) is, in effect, a form of suicide, born of despair. But Peirce insists: 'Despair is insanity.' We must, he stresses, 'be guided by the rule of hope' (CP 1.405).

While Peirce's approach to knowing stands in marked contrast to Descartes', it appears to exhibit a close kinship to Karl Popper's. To some extent, this is true. But this makes the differences all the more important. One particular difference bears upon our focal consideration — Peirce's understanding of abduction. Hence, it more than any other point of disagreement invites discussion here.

One of the most distinctive features of Peirce's account of science is the centrality he grants to abduction, as a logical operation rather than psychological process. Karl Popper and countless others have also stressed,

in their depictions of science, the central role of explanatory guesses, but there are crucial differences between these depictions and Peirce's account. The most important of these differences is that Popper and others take the formation of hypotheses to be a mysterious, psychological process, whereas Peirce approaches this phenomenon as being, in some measure, an explicable, logical operation. It is helpful to note that, for Peirce, self a phenomenon calling for explanation of various sorts (logical as well as biological, psychological, and historical). The classification of abduction as an inexplicable psychological process was part of Popper's efforts to eliminate psychologism (1968: 31–32; cf. Colapietro 2003). But Peirce was no less of an opponent of psychologism than was Popper. In conceiving the formation of hypotheses as an intelligible, logical operation, he was not basing the logic of science on contingent facts of human psychology or, more broadly, animal psychology; he was rather extending this logic to include the pivot around which the testing, revision, and indeed rejection of theories turn.

Peirce would certainly agree with Popper that the work of the scientist consists in putting forward and testing theories' (1968: 31). But he would strongly disagree with Popper's insistence that the inaugural phase of scientific inquiry falls outside the scope of a strictly logical analysis of scientific knowledge.<sup>14</sup> Peirce fully realized that an explanatory guess or abductive suggestion comes to us like a flash. It is an act of *insight*, although of extremely fallible insight (CP 5.181; also EP 2: 227). The formal derivation of a necessary conclusion from explicitly formulated premises stands in marked contrast to the insight by which a 'theory' is put forward for our consideration. But this simply means that the *logic* of abduction is distinct from that of deduction, not that the generation of explanatory suggestions falls entirely outside the purview of logical inquiry.

At least, this is Peirce's guess regarding the business of guessing when taken to be integral to the work of scientists. And it is, at bottom, nothing more than a guess. In the first instance, this guess has no more force or authority than that of a potentially illuminating suggestion. The *might be so* of abductive suggestion contrasts sharply with the *must be so* of deductive derivation. Peirce's guess in this context, like all other guesses, is a sign of possibility, not a sign of either actuality or necessity. In the course of inquiry, it *might* prove itself to be more than a *might-be* (or mere possibility); at the outset of investigation, however, its power and thus worth are yet to be determined. They can however only be determined experientially. If its explanatory power is limited to the particular phenomenon it was initially designed to explain, it is almost certainly the case that the power and worth of the explanatory suggestion will be judged to be

deficient. The power of our explanatory guesses is largely defined by the range of their experiential applicability; the wider the range of their applicability, the greater their explanatory power.

#### 4. Experience and reason

Allow me to highlight two important consequences of the Peircean approach to abductive suggestions.<sup>15</sup> One concerns the character of experience, the other that of reason. For Peirce, experience is primarily, but not solely, a brute force exercising an eliminative function; so, too, reason is not exclusively a critical capacity devoid of a creative function.<sup>16</sup> In the language of Peirce's categories, *thirtness* is inherent in experience, just as *bruteness* is integral to reason. While human experience is a phenomenon in which brute opposition tends to be most prominent, it is also a phenomenon in which the firmness of qualitative immediacy and the *thirtness* of an evoking intelligibility are observably present. While human rationality is a phenomenon in which the critical function of evaluative judgment (e.g., the sort of judgment involved when an argument is shown to be sound, or an assertion true, or a concept meaningful) seems to be predominant, it is also a phenomenon in which the firmness of creative suggestions and the *thirtness* of comprehensive intelligibility are manifestly present. Such reason is nothing less than a drive for an ever more encompassing and integrated understanding of the myriad disclosures of our varied experiences: it is at once an insistence upon an intelligibility beyond any yet disclosed by our experience and the recognition of (or, at least, reliance upon) the connections, meanings, and regularities always already present in our experience.

Human experience is more than a brute force tempering and tutoring our irrational propensities. If it were merely such a force, it would be essentially tyrannical. Despite its harshness, however, experience is the site wherein the rationality within our personal possession and that transcending even our communal comprehension stand a chance of being brought into more intimate and thoroughgoing conjunction. Submitting to experience is not equivalent to prostrating ourselves before a tyrant, though it often involves going along with what we do not understand in the hope of going beyond the narrow limits of current understanding. Submission to experience avoids being a subjugation to tyranny precisely because of this hope, the abiding hope of ever more penetrating comprehension. While the secondness of experience is linked to the brute otherness of our actual experience (especially its otherness to so many of our whims and fancies, desires and dreams), the *thirtness* of experience is tied to the

evolving intelligibility of our possible experience. In its secondness, experience signifies a harshly enforced finitude: it is indeed a sign of our finitude, making painfully clear to us the limits of our understanding and power. In its thirdness, however, experience suggests the possibility of an inherently gentle ideal, one addressing us as rational agents capable of even radical self-revision.

Just as for Peirce human experience is more than a brute force, human rationality is more than a critical capacity. Such a capacity is clearly in evidence in showing that, say, this form of argumentation is reliable whereas that form is not, or this assertion accurately represents some state of affairs whereas that assertion does not. But the exercise of reason is not exhausted by the undeniably important business of critical judgment. In sum, there is a reasonableness inherent in experience and also a creativity constitutive of rationality. These are two of the most important consequences flowing from the Peircean approach to abductive suggestion.

##### 5. A twofold kinship

In addition to these two consequences, allow me to underscore a twofold kinship. Both forms of affiliation bear directly upon Peirce's understanding of abduction. On the one hand, there is the kinship between human reason and cosmic Reason. On the other, there is that between science and art. The first form of kinship is one of the ways Peirce affirms that we are part of Nature. The second is one of the ways he tries to show that science no less than art involves the work of imagination. Regarding the first, his reliance on metaphor is explicit: we are the *offspring* of Nature and our capacity to make discoveries regarding natural processes and mechanisms bears testimony of this origin. That is, he imagines nature as our parent. But, in turn, he naturalizes imagination as the power in and through which both the creative and critical functions of human rationality take their distinctive shapes. The unavoidable imaging of nature and the proposed naturalizing of imagination are, thus, distinctive emphases in Peirce's nuanced account of abductive suggestion, at least when this account is fully considered. The indispensability of metaphor and other figures of speech (or forms of figuraton) itself points to the ineliminability of imagination in any adequate account of scientific inquiry. The naturalization of imagination in turn is a step toward making intelligible the commonplace operation by which explanatory hypotheses are put forward, for it refuses to classify this operation as an intractably mysterious process. The formulation of hypotheses, understood precisely as the work

of imagination, is not only a natural process but also a discriminable phase in a human practice (cf. Anderson). As both such a process and such a phase, it is susceptible of analysis. As an endlessly recurrent phase in an ongoing practice, identified and investigated for the purpose of refining the conduct of practitioners, this operation calls for and is susceptible to *logical* analysis (cf. Popper 1968: 31). This is so at least if such analysis aims at being more than a retrospective, rational reconstruction of self-critical investigation (ibid.). If a philosopher of science is animated by the ambition to offer a compelling codification of the consolidated results of our most accredited scientific practices, a rational reconstruction of experimental inquiry will assume a retrospective cast. But if a theorist of science is more concerned to capture the dynamic, open-ended character of experimental, self-controlled investigation, rational reconstruction must have a prospective orientation. Such a theorist cannot be content with codifying what has been achieved and, by virtue of these exemplary achievements, accorded a normative status (science is what these sciences *do* or, better, *have done*). The anticipation of future developments is, for such an individual, at least as important as the codification of past accomplishments. Of course, synechism (or the doctrine of continuity) prompts us to suppose that the present is and indeed the future will be, in some manner and measure, continuous with the past. But human history in any of its distinguishable domains is never a seamless continuum. Whatever continuity there will be between past and future practices, including the practices of inquirers, there is for inquirers at countless junctures the critical question of whether it is wise or not to do the done thing, to continue undertaking a particular line of investigation in accord with the successful procedures of their predecessors. If the logic of science is, first and foremost, the logic of abduction, then what *might be* the case has priority over what has actually proven itself to be the case. So, too, the indeterminate future has priority over both the determinate past and the actual present (in contrast to the nascent present). There are occasions when Peirce uses the expression 'anticipations of experience,' but his usage goes beyond the meaning(s) this expression carried in either Francis Bacon's *Novum Organon* or Immanuel Kant's *Critique of Pure Reason*. Whereas the meaning of this expression is distorted in Bacon's text by his blind inductivism (a result of his neglect of the role of hypothesis in the conduct of inquirers) and in Kant's by his vestigial deductivism (evident in his transcendental refusal to admit hypotheses at the most basic level), this expression has in Peirce's writings a thoroughly naturalistic and experimental significance.

We are equipped by our biological constitution and experiential learning to divine the workings of nature, at least those bearing so persistently

upon our motility and sociability (see, e.g., *CP* 6.418; 6.491). Humans are like other animals in 'being endowed with understanding sufficient for the conduct of life' (*CP* 6.480), at least for life in its most rudimentary or primitive form (cf. *CP* 5.511). They have, 'in some degree, a divinatory power . . . like that of a wasp or a bird' (*CP* 6.477). In other words, Peirce supposes there to be a kinship between cosmic Reason and our somatically rooted, culturally nurtured capacity to make sense out of both ourselves and our world. He further supposes that, apart from this conjectured competency (an innate capacity to guess better than the results of pure chance), our knowledge and even existence would be inexplicable: 'If man had not had the gift, which every other animal has, of a mind adapted to his requirements, he not only could not have acquired any knowledge, but he could not have maintained his existence for a single generation' (*CP* 6.603). As preposterous as it must sound to many readers, Peirce supposes an attunement between the logic of human reason and the logic of cosmic affairs — the way we try to understand what is going on and the way things go. The survival of our species and the successes of our conjectures suggest such an attunement — at least, they suggested this to Peirce.

'It is,' he writes, 'somehow more than a mere figure of speech [though it is unquestionably a metaphor] to say that nature fecundates the mind of man with ideas which, when those ideas grow up, will resemble their father, Nature' (*CP* 5.591).<sup>16</sup> We are the offspring of nature, ones equipped to recognize our affinity with our origin.

Limits of space permit me to do only slightly more than identify the second instance of kinship. This is the kinship between the scientific and the artistic imagination. Peirce's emphasis on the reliance of experimentalists on imagination is itself a sign of his appreciation of this kinship: science no less than art is an adventure of the imagination. He goes so far as to say: 'next after the passion to learn there is no quality so indispensable to the successful prosecution of science as imagination' (*CP* 1.47). Indeed, Peirce insists, 'there is, after all, nothing but imagination that can ever supply individuals who are truly ardently desirous to know the truth "any inking of the truth" (*CP* 1.46). But this does not collapse the distinction between the creative discoveries of experimental inquirers and the disclosive creations of artistic innovators. Peirce is quite explicit about this: 'There are, no doubt, kinds of imagination of no value in science, mere artistic imagination, mere dreaming of opportunities for gain' (*CP* 1.48; cf. *CP* 1.43). The form of imagination relevant to the execution of science 'dreams of explanations and laws' (*CP* 1.48).

But this is likely to suggest too distant a kinship between scientific and artistic imagination. In 'A Guess at the Riddle,' Peirce suggests that the

highest kind of intellectual synthesis is one 'the mind is compelled to make neither by the inward attractions of the feelings or representations, nor by a transcendental force of necessity' (*CP* 1.383).<sup>17</sup> That is, there are syntheses due to the exterior compulsions of outward experience (e.g., we cannot put the cart before the horse because in our experience of their relationship the horse pulls the cart) and ones due to nothing more than resemblances noted by our minds. In addition, however, there are syntheses (or constructions) the mind is disposed to make simply 'in the interest of intelligibility' (*CP* 1.383). These involve 'introducing an idea not contained in the data' but one bringing together in an intimate and intelligible manner what would otherwise be disparate and thereby unintelligible. Peirce notes: 'This kind of synthesis has not been sufficiently studied, and especially the intimate relationship of its different varieties has not been duly considered.' What he means here includes the 'intimate relationship' between the constructions of the artistic imagination and those of the scientific imagination, for he immediately adds: 'The work of the poet or novelist is not so utterly different from that of the scientific man [or woman].' The affinity resides in the suggestion of a synthesizing fiction put forth in the interest of greater intelligibility than would be otherwise obtainable. Just as science as much as art is dependent upon the imagination, so art as much as science is a process wherein conjectures are continuously put forth and, not infrequently, severely tested. If this is so, Peirce's conception of abduction suggests affinities and affiliations where alternative conceptions buttress the barriers so prized by dualists (e.g., the supposedly insurmountable wall between the artistic and the scientific imagination). This seems appropriate for a thinker so wedded to synchism (or the doctrine of continuity), for the implication here is that art and science cannot be separated from one another. They are in a sense continuous. For both art and science involve fabrications crafted in the interest of intelligibility. This is no insignificant or superficial kinship.

## 6. Conclusion: Conjectures about Peirce's conjectures

Peirce once suggested that his 'philosophy may be described as the attempt of a physicist to make such conjecture as to the constitution of the universe as the methods of science may permit, with the aid of all that has been done by previous philosophers' (*CP* 1.7). It is important to note and, indeed, to stress that this description has only the status of a suggestion. In other words, this description is itself a conjecture. The fact that it is a conjecture made by the conjecturer himself about the nature of his own

endeavor does not alter the status of this description. Elsewhere, Peirce makes an intriguing observation about Plato, arguably an observation as applicable to Peirce as his predecessor. In a lecture entitled 'Philosophy and the Conduct of Life,' he suggests: 'Although Plato's whole philosophy is a philosophy of Thirddness . . . he himself only recognizes duality, and makes himself an apostle of Dichotomy, — which is a misunderstanding of himself' (*EP* 2: 38). Then Peirce adds (and this, not the previously quoted text, is arguably an observation as applicable to Peirce as Plato): 'This self-misunderstanding, this failure to recognize his own conceptions, marks Plato throughout. It is characteristic of the man that he sees much deeper into the nature of things than he does into the nature of his own philosophy, and it is a trait to which we cannot altogether refuse our esteem.'

Peirce's quest of quests turns out to be a series of guesses about both the importance of guessing and the nature of his own attempts to illuminate the sole means by which human knowledge is amplified. His quest of quests is, in brief, a guess about guessing. By the time the young Peirce had turned his attention to science (thus, long before the mature Peirce revised his earlier views), the logic of apodictic certainty had been discredited by the history of experimental inquiry. For centuries, the practice of geometers had provided the ideal of science (or *epistēmē*): the derivation of necessary conclusions from indubitable premises alone merited the name of science in an unqualified sense. But such a theory of science failed utterly to accord with the practice of scientists or experimentalists. In the mouths of scientists themselves, *science* does not primarily mean consolidated or accredited discoveries, but the living and hence growing practices of historical communities of experimental inquirers.

Not only did Peirce's quest of quest have at its center a guess regarding guessing, his insistence upon the evolution of hypotheses was inseparable from his acceptance of the hypothesis of evolution. An invaluable hint here is his suggestion that a guess in science is like chance variation in biological evolution (*CP* 7.38). The work of generating and testing hypotheses — that is, the work of scientists — is partly explicable as a biological phenomenon but also partly analyzable as a logical operational phenomenon but also partly analyzable as a logical operational phenomenon. The experimental inquirer, precisely as an implicated agent (an agent implicated in an historically evolved and evolving set of practices), undertakes the analysis of this operation, and the inquirer does so for the sake of inquiry — in the hope such analysis will provide anticipations of experience as the irrepressible source of human confoundment.

If we truly draw our clues from the practices of scientists, then our theory of science must bring into sharp focus the extent and ways in which science is evolutionary. But, in this context, evolutionary cannot

be opposed to revolutionary, as a way of contrasting gradual, incremental development with rapid, dramatic alteration. Science is nothing less than the ongoing evolution of explanatory hypotheses competing for critical consideration. The evolution of hypotheses, as exemplified by the work of scientists, demands a reconsideration of the hypothesis of evolution. At least, Peirce felt that this evolution demanded such reconsideration. A purely Darwinian theory of evolutionary development can no more account for the evolution of organic forms than it can account for the evolution of tenable hypotheses. The firstness of chance variation needs to be supplemented not only by the secondness of environmental constraints (including cataclysmic upheavals) but also by the thirddness of cherishing concern.

There is of course no necessity that the evolution of scientific guesses conforms to the pattern of biological evolution. Indeed, such conformity is, at the outset, quite implausible. But, in accord with Peirce's economy of research, such (seemingly) readily testable, yet (in some respects) initially implausible hypotheses, are precisely the ones with which we should commence.

A truly experimental understanding of science, envisioned as (more than anything else) the evolution of more or less tenable hypotheses, requires an evolving understanding of evolution. In his theory of signs, Peirce both opened a field of inquiry and cultivated large stretches of this fertile field. So, too, in his exploration of abduction, he offered suggestive hypotheses about abductive suggestion, then carefully developed some of the consequences of these hypotheses and even brought some of these consequences to the test of experience. Abduction, understood as an irreducible mode of inference, was at the center of Peirce's interest in this topic. But, radiating out from this center, there were a number of other considerations. In this paper, I have been able only to hint at the range of these considerations, but my hope is that even such an abridged series of hints will assist scholars in orienting themselves to Peirce's wide-ranging series of guesses. None of these guesses are more important for either understanding the unique contribution of Peirce's intellectual labors or carrying forward his work (cf. Hintikka 1998) than those concerning the nature, centrality, and irreducibility of abduction.

#### Notes

1. This is evident in one of his most famous characterizations of semiotic, one in which he identifies semiotic with logic and defines this branch of inquiry as 'the quasi-necessary, or formal, doctrine of signs.' But he immediately adds: 'By describing the

- doctrine as 'quasi-necessary,' or formal, I mean that we observe the characters of such signs as we know, and from such an observation, by a process which I will not object to naming Abstraction, we are led to statements, eminently fallible, and therefore in one sense by no means necessary, as to what *may* be the characters of all signs used by a 'scientific' intelligence, that is to say, by an intelligence capable of learning by experience' (CP 2.227).
2. The method of tenacity, being individualistic, is the most insular of these methods. But the method of authority, being communal, is nonetheless insular in insulating the institutional authority of a finite community from the experience and reflections of other communities. See Sorrell (forthcoming).
3. The abstract definition of reality (reality as secondness, reality in its otherness from what any finite individual or community happens to think) reaches only the second level of clarity. The pragmatic clarification of reality signifies the third (or a higher) grade of clearness. So clarified, reality is explicitly conceived in relationship to its power to modify (at least) the intellectual habits of human agents. In other words, reality is conceived in terms of thirdness.
4. In *The Pragmatic Philosophy of C. S. Peirce*, Manley Thompson contends: '[E]ven in this final appeal to the self-controlled growth of inquiry, some remnant of the doctrine of substance persists in the notion of a self which exercises the control and renders the development possible' (266). He goes on to argue that Peirce's rejection of this doctrine deprives Peirce of what he presupposes — a substantial self who is capable of exercising autonomous control. See, however, Colapietro 1989: 81–86; Porter 1996: ch. 7; and Sorrell (forthcoming).
5. In the previous article in this series ('What Pragmatism Is') Peirce bemoaned 'the interclass ways' words are treated 'when they fall into literary clutches' (CP 414). Because the term *pragmatism* was so often being used 'to express some meaning that it was rather designed to exclude,' he felt compelled 'to kiss his child good-bye and relinquish it to its higher destiny; while to serve the precise purpose of expressing the original definition, he begs to announce the birth of the word 'pragmaticism,' which is ugly enough to be safe from kidnappers' (CP 5.414).
6. The third articles in this series, originally published in *The Monitor* and reprinted in *The Collected Papers*, is 'Prolegomena to an Apology for Pragmatism.' While the first two articles ('What Pragmatism Is' and 'Issues of Pragmatism') appear in volume 5 of *The Collected Papers*, the third article appears in volume 4. This is unfortunate since the three articles were conceived and executed in conjunction with one another, thus providing us with a mature statement of Peirce's pragmatist position. Read in connection with his 1903 Lectures on Pragmatism and manuscripts (especially MS 318) from roughly these same years, these three essays are truly an invaluable source for understanding Peirce's pragmatism, semiotic, and the connection between the two doctrines. The emphasis on self-controlled conduct and, more specifically, self-controlled inquiry is manifest in these writings. They are part of Peirce's *oplogos* (or 'argument') for pragmatism in which argument, as a species of sign, is explicitly related to the ideal of self-control. An argument 'is a Sign which has the Form of tending to act upon the Interpreter through his own self-control, representing a process of change in thoughts or signs, as if to induce this change in the Interpreter' (CP 4.538).
7. The determination of these limits, *in practice*, is often a thorny personal, political, and epistemic question. It is instructive to recall here that Peirce identified common sense with 'the resultant of the traditional experience of mankind' (CP 1.654). This implies that *experience* might

- refer either to the life history of an individual organism or the intergenerational experience of some more or less determinate community (including as indeterminate a community as that of humankind). Cf. Colapietro 1997b: 26–27.
9. Peirce's alleged scientism might be seen for what it is if in contemporary contexts we place the stress on experimentation rather than science. Art and politics are as much sites of experimentation as are physics and chemistry.
10. Emphatic negations can be ambiguous. This is implied in Peirce's contention: 'Experiment, after all, is an uncommunicative informant. It never expatiates: it only answers 'yes' or 'no' or rather it usually snaps out 'No!' or, at best only utters an inarticulate grant for the negation of its 'no' (CP 5.428).
11. This meant abandoning what the pragmatist John Dewey would come to call the quest for certainty. The applicability of even the most certain formal or mathematical truths to the world of our experience, Peirce himself insists, 'opens the door to probability, and shuts out absolute necessity and certainty, *in toto*' (CP 6.595). Peirce actually enters the lion's den and tries to show that deduction is itself, at bottom, an instance of experimentation: 'Deduction is,' he suggests, 'really a matter of perception and experimentation, just as induction and hypothetic inference are; only, the perception and experimentation are concerned with imaginary objects instead of with real ones. The operations of perception and of experimentation are subject to error,' even in the realm of mathematics (CP 6.595).
12. 'The first starting of a hypothesis and the entertaining of it, whether as a simple interrogation or with any degree of confidence, is an inferential step which I propose to call *abduction*. This will include a preference for any one hypothesis over others ...' (CP 6.525). In accord with his ethics of terminology (see, e.g., CP 2.219–226), this operation deserves a name as a way of marking its difference from the allied operations of deduction and induction: 'I call all such inference by the peculiar name, *abduction*, because its legitimacy depends upon altogether principles than those of other kinds of inference' (CP 6.525). For a brief but extremely informative account of how Peirce's thinking about this topic evolved, see Anderson 1986.
13. There is, Peirce insists, 'a world of difference between fallible knowledge and no knowledge' (CP 1.37).
14. Whether or not these two points are accurately identified as *consequences* is open to dispute. Proceeding in accord with the model of putting forth a conjecture and then deriving consequences from this conjecture, in order to be in a position to test the hypothesis in question, (i.e., proceeding in accord with the Peircean model of rational persuasion), I will identify these points as consequences.
15. In *An Unsettled Quest: An Intellectual Autobiography*, Karl Popper asserts: 'There is no better synonym for "rational" than "critical" (1982: 87). In contrast, Peirce's conception of rationality encompasses a creative as well as critical function (Colapietro 1987: 291–98). This is nowhere more evident than in his insistence upon classifying abduction as a mode of inference.
16. It might seem odd that Peirce reverses the gender of the traditional metaphor (Mother Nature). But in doing so he makes the *man* in his text a woman.
17. A case (in my judgment, a quite strong case) can be made for correlating the three forms of intellectual synthesis identified in this passage with the three forms of biological evolution distinguished elsewhere in 'A Guess at the Riddle.' Also, more proximately, the first two modes of synthesis distinguished by Peirce here correspond closely to the two forms of association (that by contiguity and that by resemblance) so stressed by the associationist psychologists (including David Hume).

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## Peirce's late theory of abduction: A comprehensive account

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This theory will make no pretensions to being knowledge, only to being a good guess, which we may strongly and confidently hope will be confirmed.

—Charles Sanders Peirce (1903, MS 476)

### Abstract

This paper presents a comprehensive account of Peirce's post-1900 theory of abduction. The account aims at bringing together various strands of discussion in Peirce's work, showing how their interaction creates a more coherent picture of his thoughts on abductive reasoning as manifest after the turn of the century. The discussion is of a historical nature, rather than a critical assessment.

### 1. Introduction

#### 1.1. Aim

There has been a fair amount of discussion about the nature of Peirce's 'late' theory of abduction. Burks, in a short paper in 1946, pointed out the significant turn in Peirce's thinking coming about around the turn of the century. It was Fann who, in his Master's thesis (Fann 1970), lent further support to Burks' observation by tracing the developments in Peirce's thinking from the early 1860's until Peirce's death in 1914, distinguishing an 'early' period (1865–1875), a transition period, and a 'late' period (1890–1914). Thereupon, various scholars have focused on specific aspects of abduction, for example creativity (Anderson 1987), guessing instinct (Ayim 1972), the link to Peirce's phenomenology (Bertlsson 1978; Kellner 1986b), and the process of inquiry (Kevelson 1987; Miska 1991).