



Nathan Houser

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Reconsidering Peirce's Relevance

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In June 2007, an international conference convened at the University of Helsinki to explore the emerging interest in the thought of Charles S. Peirce and to consider the applicability of Peirce's ideas to diverse fields of inquiry.¹ To underscore the breadth they were aiming for, the conference organizers listed the following fields of relevance: logic, abductive reasoning, communication and rhetoric, contemporary philosophical debates, mathematics, artificial intelligence, cognitive science, linguistics, literary studies, the study of fine arts and design, physics, biology, psychology, sociology, and anthropology. The Helsinki Conference was held in conjunction with the 9th World Congress of Semiotics, so semiotic and textual studies were also areas of interest. The conference opened with a general survey of the breadth and influence of Peirce's thought² and with a stimulating discussion of T. L. Short's newly published book, *Peirce's Theory of Signs* (2007).³ As the conference unfolded, the application of Peirce's thought in additional fields or sub-fields was explored including architecture, virtual reality, data modeling, and other new media applications, geology, and such intriguing and specialized studies as distributed intentionality and semantic webs. Several papers dealt with graphical logic; in particular, with applications of Peirce's well-known (at least becoming so) Existential Graphs, and those applications dealt with a number of interesting issues including

¹ The conference, *Applying Peirce*, was arranged by the Helsinki Peirce Research Centre and was sponsored by the Charles S. Peirce Society and the Philosophical Society of Finland.

² This introductory essay is a revision of the keynote lecture for the Helsinki Conference.

³ The participants in this Author Meets Critics symposium were Mats Bergman, Risto Hilpinen, James Liszka, and the author, T. L. Short.

problems in information theory as well as in language representation and processing. Some papers, and a workshop, dealt with how Peirce's ideas inform, or might inform, editing theory and practice.

This overview of topics covered during the three days of the Helsinki Conference provides a comprehensive glance at where to look for effective applications of Peirce's ideas. As I go on, I will add a few more areas in which Peirce's thought has been found relevant, although I will certainly not attempt to be exhaustive – that, I believe, would be an all but impossible undertaking in any case. But first I want to remark on why I believe the theme of the Helsinki Conference, *Applying Peirce*, might at first strike one as a little curious, and might even be slightly unsettling.

The crux of this concern has to do with what is meant by "Applying Peirce." The idea of applied philosophy as opposed to pure philosophy comes to mind, a distinction similar to that between applied and pure science. It may seem ironic to ask of the father of pragmatism what part of his work could be usefully applied. Is it not very nearly the point of pragmatism to undo the dichotomy between pure and applied thought? Can we not think of Peirce's pragmatic maxim as a formula, or routine, for turning every meaningful conception into something of practical relevance – for turning conceptions, we might say, into something that can be applied? Once we get the idea of this connection between conceptions and practice we can begin to appreciate the profound link Peirce saw between ideals and behavior. This suggests that perhaps the regimens we have to undertake to impose self-control on the development of our habits of behavior are among the most important applications of Peirce's philosophy that we can imagine. Yet, it seems to me that this is not quite the kind of application the organizers of the Helsinki Conference had in mind.

If Peirce held that the gist of his pragmatism was to bridge the dichotomy between pure and applied thought why did he, in 1898, make his much criticized distinction between theoretical issues and matters of vital importance? Here is his claim:

[P]ure theoretical knowledge, or science, has nothing directly to say concerning practical matters, and nothing even applicable at all to vital crises. Theory is applicable to minor practical affairs; but matters of vital importance must be left to sentiment, that is, to instinct.

EP 2:33

This seems inconsistent. However, the apparent inconsistency disappears if appropriate emphasis is given to Peirce's qualifiers: "directly" and "vital." This was not a denial of any of the basic tenets of pragmatism but

was, instead, a statement of Peirce's belief that science is, and should be, guided by reason, with the test of experience coming in due time, while actions in response to matters of vital importance should be guided by instincts and traditional sentiments because 1) urgency requires immediate action and 2) the fallibility of instincts and developed sentiment has *already* been mitigated over time by trial and error. So, it does not seem to me that this view, which Peirce labels sentimental or true conservatism (CP 1.661), contradicts his recognition of the inseparable union of theory and practice. In fact, Peirce, of all the classical American philosophers, had perhaps the strongest inducement for accepting that union.

Peirce spent thirty years working as a physical scientist for the U.S. Coast & Geodetic Survey where, for most of that time, he was engaged in unmistakably theory-laden scientific practices. For most of his years with the Coast Survey, Peirce was in charge of gravity determinations which, in his day, were made by counting the number of swings per second of very precisely measured pendulums. But to determine gravity as exactly as Peirce demanded, many possible sources of error had to be accounted for and theoretical considerations abounded in every case: How does one determine the effect of the dulling of the pendulum's knife edge? What is the effect of the flexure of the pendulum support? What is the effect of the viscosity of the air in which the pendulum swings (what is a satisfactory theory of hydrodynamics that can be applied to the movement of pendulums through viscous air)? What is the effect of temperature on pendulum measurements? What is the effect of the observer on observations? What are the most useful units for measuring or representing the force of gravity? And so on. Peirce spent much time working on these and other problems that explicitly concerned the application of theory or the theory of application and practice.

Gravity research was not Peirce's only work for the Coast Survey. He also worked with weights and measures and for a time was in charge of the office that oversaw these standards for the United States. Peirce carried iron bars to London and Paris to compare the U.S. standards with the British yard and the French meter. Once again, the obviously very practical comparison of the distance between the scratches on one bar and the scratches or the ends of another is very complicated by theoretical considerations concerning the choice of standards, the effects of temperature on the expansion of metals, the effectiveness of different methods of comparison, and so on. In 1885, in testimony before the Allison Commission, a special committee of the United States Congress, Peirce was questioned

extensively about U.S. physical standards. His knowledge of the weight of air at different altitudes enabled him to inform the Commission that the gold coins minted in Denver contained more gold than their counterparts minted in Philadelphia, because the standard used to weigh out the gold was a hollow brass weight and the air trapped inside weighed more in Denver than it did in Philadelphia. Peirce expressed his belief that the United States needed a special agency to manage weights and measures, and it is thought that his testimony contributed to the congressional decision to create the U.S. National Bureau of Standards.⁴

Peirce also worked on cartography for the Coast Survey, especially on map projections. Between 1876 and 1879, he created a new projection called the quincuncial projection, which allowed for repetition of the Earth's sphere in transposed positions on a map so that any location might be viewed as occupying a central position relative to the rest of the Earth. This projection preserved the angles at the junctions of latitude and longitude as much as possible by consolidating distortions near the poles. Peirce's map was used during World War II for charting international air routes and is still used for educational purposes today.⁵

One can see from these examples, and I could give many more, that Peirce's work as a scientist would have given him strong inducement for accepting the intimate union of theory and practice. Theory, for Peirce, is like the law; practice like the sheriff. Theory is thirdness; practice secondness. Theory conceives and guides; practice gets things done. Although he seems always to have favored theory over practice as the focus of his own intellectual energy, he certainly understood that each required the other: "Law, without force to carry it out, would be a court without a sheriff; and all its dicta would be vaporings" (CP 1.212). Indeed, as I have briefly illustrated, Peirce contributed to applied science in many ways and there is good reason to believe that the application of theory to practice was of considerable interest to him, so we might even suppose, with the caution due counterfactual suppositions, that Peirce would have warmly welcomed the attention the organizers of the Helsinki Conference drew to applications of his thought. I believe, however, as evidenced by the scope of the papers

⁴ The Allison Commission (1884–85) was a bipartisan congressional committee which, among other things, investigated a charge that several government agencies, the Coast Survey among them, were doing research for abstract and not strictly practical purposes. It was not long after those hearings when a great effort was started to reduce the cost of science by severely limiting funding for primarily theoretical research. For a brief recounting of Peirce's encounter with the Allison Commission see W 5:xxviii–xxx.

⁵ See Carolyn Eisele's "The Problem of Map Projections", in Eisele (1979, pp. 145–59).

presented at the conference, that the idea of application that the organizers had in mind was not so much “practical application” as it was “relevance for contemporary issues and problems” whether those issues and problems were theoretical or practical – or inseparably both at once.

Using this broad conception of what it means to “apply” Peirce, I’ll turn now to a consideration of a prior estimate of Peirce’s relevance, that of the renowned Peirce scholar, Max H. Fisch. When Fisch wrote his well-known article, “The Range of Peirce’s Relevance,” for the 1980 special Peirce issue of *The Monist*,⁶ an earlier resurgence of interest in Peirce’s philosophy was just getting underway (partly due, perhaps, to the work of the Peirce Edition Project, and also to such stimulants as the 1976 Peirce Bicentennial International Congress in Amsterdam and a 1979 Peirce issue of *Synthese*.⁷ But Peirce’s contributions to philosophy were still mainly referenced only in footnotes and even then not all that often. It was not until 1982, two years after Fisch’s article appeared, when Hilary Putnam, in his paper “Peirce the Logician” announced that most of the important developments that shaped modern logic before 1900, including quantification, derived from the Boole-Peirce tradition. The *Synthese* Peirce issue and Putnam’s paper appeared at a time when historical questions about logic and analytical philosophy were beginning to gain interest and it helped launch a new assessment of Peirce’s contributions. Discussions of Peirce’s importance for the development of modern logic began to move out of footnotes and into articles and books. By 1989, even W. V. O. Quine was ready to admit that it was Peirce’s breakthrough with the theory of quantification that mattered historically.⁸

But when Fisch wrote his paper, Peirce’s relevance and his polymathic scope were for most philosophers and historians of ideas only rumors and were often thought extravagant, so Fisch had to spend a lot of time convincing his readers of much that we take for granted now – even that Peirce had made an important contribution to semiotics. Fisch consid-

⁶ Fisch’s article originally appeared in two parts in *The Monist* 63 (1980): 269–76 and in *The Monist* 65 (1982): 123–41. It was reprinted in *The Relevance of Charles Peirce*, ed. E. Freeman (LaSalle, IL: The Hegeler Institute, 1983, pp. 11–37) and in *Peirce, Semiotic, and Pragmatism; Essays by Max H. Fisch*, eds. K. L. Ketner and C. J. W. Kloesel (Bloomington: Indiana University Press, 1986, pp. 422–48). References to Fisch’s paper throughout the remainder of this paper will be to the reprint in the Ketner and Kloesel volume.

⁷ The proceedings of the 1976 congress were published in *Proceedings of the C. S. Peirce Bicentennial International Congress*, eds. K. L. Ketner, J. M. Ransdell, C. Eisele, M. H. Fisch, and C. S. Hardwich (Lubbock: Texas Tech Press, 1981). The Peirce issue of *Synthese*, “Essays on the Philosophy of Charles Peirce”, was issue no. 1 of vol. 41 (1979).

⁸ For Quine’s assessment of Peirce’s historical importance, see Quine (1999).

ered Peirce's relevance in three sections, one that looked back to Peirce's relevance for his own time, one that considered his relevance for the scene current at the time of Fisch's article, and a third section that looked forward to relevance arguably yet to come. I'll follow Fisch through a select few of his observations and predictions remarking on developments during the thirty years since he wrote his article.

Fisch emphasized "Peirce's almost single-handed advocacy of infinitesimals against the long dominant method and doctrine of limits" and noted that "The philosophical relevance... lies in the proof that we *can* reason logically and mathematically about infinity, and therefore about continuity" (Fisch, 1986, p. 432). As we move into the 21st century, the study of Peirce's philosophy of mathematics is on the ascendance. Many papers and dissertations in recent years have addressed topics in this area, and a philosopher from Brooklyn College, Matthew Moore, has recently edited a selection of Peirce's writings on set theory and the continuum (PM) and, also, a new collection of essays on Peirce's philosophy of mathematics (Moore, 2010).

Another very interesting contribution of Peirce's that Fisch discussed was his early work in experimental psychology, leading some to claim that Peirce was America's first modern experimental psychologist (Caddwalller, 1974). This is not a far-fetched claim. It is based on Peirce's collaboration at Johns Hopkins with his student, Joseph Jastrow, the person who indirectly provided Wittgenstein with the famous duck-rabbit example. I described Peirce's collaboration with Jastrow in the introduction to Volume 5 of the Indianapolis Chronological Edition (w5:xxv-xxvi):

Peirce suggested to Jastrow that they undertake an experiment to test Fechner's claim that human sensations are subject to a limitation he called a *Differenzschwelle* (the minimum perceptible difference of sensation). Below this threshold it was said to be impossible to discern differences of intensity. Peirce and Jastrow conducted elaborate experiments between 10 December 1883 and 7 April 1884 that constituted the first psychological investigation undertaken at Johns Hopkins and one of the earliest studies in experimental psychology in North America. Peirce described the experiment in a letter to Simon Newcomb dated 7 January 1908:

"I note that you ac[c]ept as *established* the dictum of Gustav Theodor Fechner that the least sensible ratio of light is 101/100. If you will look in volume III Mem. of the U.S. Nat. Acad. of Sci. you will find a paper by me and my then student in logic Joseph Jastrow devoted to the question whether there is or is not such a thing as a "Differenz-

Schwelle” or least perceptible difference of sensation... [We] began with sensations of pressure and for a reason I will shortly mention we ended there. At once, using such precautions as any astronomer would use in observing faint nebulas, without any practice we found that if there were any least perceptible ratio of pressure, it was twenty or thirty times nearer unity than the psychologists had made it to be. We afterward tried to do the same thing for light; but were stopped by the utter impossibility of getting a piece of Bristol board containing a square inch of uniform luminosity. No doubt this might have been overcome. But Jastrow and I were severally pressed with other work and we dropped the investigation – contenting ourselves with what we had done.”

They had good reason to be content. Their report . . . , presented to the National Academy of Sciences on 17 October 1884 and published in the Academy’s *Memoirs* in 1885, is described by Stephen M. Stigler as unexcelled in the nineteenth century and “a good example of a well-planned and well-documented experiment today”. Stigler points out that the study was the first to employ a “precise, mathematically sound randomization scheme,” and also the first to require subjects to state their confidence in their choice (weight A is lighter or heavier than weight B) and to choose even when the level of confidence was zero. Ian Hacking, who also discusses the experiment, points out that Peirce’s understanding of the importance of randomization was at least three decades ahead of his time. Yet, Peirce’s idea was forcefully rejected by E. B. Titchener for being out of touch with psychological reality, and it was not reintroduced until R. A. Fisher’s *Design of Experiments* appeared in 1935. Hacking also remarks on the interesting last paragraph. . . where Peirce and Jastrow indicate that their conclusion has important bearings on such questions as women’s insight and telepathic phenomena. The word “telepathy” was less than two years old, according to Hacking.

So here we have a good example of ground-breaking work based on theory, tested by experiment, and with application to the study of the limits of human perception and intuition (as well as claims concerning paranormal experiences such as those investigated today by such institutions as the Center for Inquiry in Amherst, New York).⁹

Another example of Peirce’s relevance, also discussed by Fisch, was Peirce’s 30 December 1886 letter to Marquand recommending that he try

⁹ The Center for Inquiry (<http://www.centerforinquiry.net>), with its affiliate Committee for Skeptical Inquiry, promotes science-based inquiry and serves as a watch dog for paranormal and fringe-science claims that masquerade as objective science.

electricity for his logic machine. Peirce's letter contains the first known design for using an electric switching circuit for computing. Here, again, Peirce made a very practical and I would say prophetic application of theory. Whether Peirce's idea directly influenced the early development of modern computing is mainly a matter of historical interest, but it is noteworthy that the idea of using electricity for computing was mentioned in Baldwin's *Dictionary of Philosophy and Psychology* with specific reference to Marquand's machine. Certainly the importance of the application of the theory of electrical switches, first to logic and then to computing, cannot be minimized whether or not it was Peirce's insight that directly bore the fruit.¹⁰

It is possible that the application of Peirce's logical ideas to computing is still in its early stages. Consider, for example, the sign-engineering work of Shea Zellweger who has perfected Peirce's sixteen connective logic notation to the point where truth-functional transformations are completely mechanical and can be performed with mirrors – thus potentially at the speed of light. In recent years, Zellweger's work has spawned a small but intense flurry of research in Peirce-inspired symmetry-based logics, which I anticipate will have important computational as well as theoretical applications, though that remains to be seen.¹¹

Also along these lines is the work of Kenneth L. Ketner who, with physicist G. R. Beil, has developed an application of Peirce's logic of relations for the study of elementary particle interactions and has patented a triadic logic switch based on Peirce's mathematical formulation of his categories (Beil & Ketner, 2006). Josiah Lee Auspitz and Kilian Stoffel, applying Peirce's categories differently, were awarded a U.S. software patent for a semiotic switch for an improved process for the storage and retrieval of multi-media computer data.¹²

Perhaps even more promising for computational applications of all kinds are developments stemming from Peirce's graphical logic, especially his Existential Graphs (EG). A great deal of the promise in this area is due to John Sowa's research on automated natural language understanding and

¹⁰ See the article "Logical Machines" in Baldwin's *Dictionary of Philosophy and Psychology*, vol. 2 (<http://psychclassics.yorku.ca/Baldwin/Dictionary>). For a discussion of Peirce's and Marquand's contributions to computing see "Logic of Electronic Switching", Appendix A of Burks & Burks (1989).

¹¹ See <http://www.logic-alphabet.net> for references to Zellweger's papers and for links to related work.

¹² *Annual Report of the Sabre Foundation for 2004* (Cambridge, MA: Sabre Foundation, Inc., 2004).

the school of logic that has grown up around Sowa’s EG-based Conceptual Graphs. Several Helsinki Conference participants addressed applications based on Peirce’s graphs.¹³

Another, perhaps more surprising, area of Peirce’s relevance discussed by Fisch was economics. Fisch pointed out that Peirce was included as a precursor in mathematical economics in a 1968 book on that subject edited by William J. Baumol and Stephen M. Goldfeld, a judgment based on Peirce’s 1871 correspondence with Simon Newcomb published in 1957 by Carolyn Eisele.¹⁴ Eisele showed that Peirce was one of the first to recommend the application of the calculus to political economy and to show how to use the calculus to express basic relationships between supply and demand, the cost of production, price, and so on. Peirce’s now famous 1876 “Note on the Theory of the Economy of Research,” where he developed a theory intended to guide scientific researchers in their efforts to balance the benefit of advancing knowledge against the costs of the research, was also a factor in early recognition of his contribution to economics.¹⁵

But over the past decade it has begun to become evident through the work of Dave Dearthmont, economist James Wible, and others, that Peirce’s contribution to economic thought has been underestimated. Without going into detail, it is noteworthy that Peirce was one of the first to understand and promote A. A. Cournot’s model of duopoly and that by 1871 he had refined Cournot’s model in a way that exhibited key concepts of Nash equilibrium. In 1874 Peirce discovered the axiom of transitivity that is usually attributed to Kenneth Arrow, or to other mid-20th century economists: “If a person prefers A to B and B to C, then he also prefers A to C” (w 3:176). According to Wible, Peirce also developed advanced models of utility theory and by the 1890’s he had provided “a brief, but scathing critique of utilitarian philosophies of punishment and rehabilitation”. Wible also points out that in his [fourth] Harvard Lecture of 1903, “Peirce rejects the concept that economists have assumed for...decades, that consumer tastes and preferences should be taken as given (CP 5, p. 71)”.¹⁶

¹³ Among the participants of the Helsinki Conference who addressed applications based on EG were John Sowa, Sun-Joo Shin, Fernando Zalamea, and Ahti Pietarinen. See John Sowa’s homepage (<http://www.jfsowa.com>) for information about the Conceptual Graphs and for links to active researchers in the field.

¹⁴ Carolyn Eisele, “The Correspondence with Simon Newcomb,” in Eisele (1979, pp. 52–93).

¹⁵ Peirce’s paper was originally published in the *U.S. Coast Survey Report for 1876* (see w4:72–78). It was reprinted in *Operations Research* 15 (1967): 643–48. For discussion of Peirce’s paper see Rescher (1976), and Wible (1994).

¹⁶ The quotations are from Wible’s contribution to a discussion of Peirce’s contributions to economics carried out on the Peirce-L forum. For Wible’s reference to

Finally, in recent years it has become better-known that the founders of the so-called Institutional School of Economics had close ties to Peirce and Dewey¹⁷ – Thorstein Veblen, for example, one of the founders, was a student of Peirce at Johns Hopkins. Recently, Joseph Ransdell made the astute observation that the “Institutional School’s conception of economic institutions as mediational systems” appears to apply Peircean semiotic principles to economics. This is a highly suggestive clue for future research.¹⁸

Fisch discusses many more contributions of significance including Peirce’s theory of abduction, which began to be considered relevant in the 1960’s, with the work of Norwood Russell Hanson, and is now a growth industry and is understood, rather as I believe Peirce would have hoped, to be of critical importance for cognitive science.¹⁹

Fisch’s second section began with a long discussion of the relevance of Peirce’s theory of signs. In 1980, semiotics “as a field of systematic study” was still very young and in some quarters there were doubts about Peirce’s relevance. Fisch’s (1986) view was that “It may be safely predicted that in [semiotics] at least Peirce will long remain relevant as providing a framework within which semioticians can locate the more limited ranges of their own researches” (p. 430). Fisch then pointed out that Peirce had been “a lifelong student of comparative linguistics” and he quoted Jakobson’s claim that Peirce is “the deepest inquirer into the essence of signs” and Jakobson’s belief that Peirce’s statement that “a symbol may have an icon or an index incorporated into it” as opening “new, urgent tasks and far-reaching vistas to the science of language” (ibid.; see Jakobson, 1959, p. 233; 1965; 1971, p. 357). I believe this is as germane today as it was when Jakobson wrote it.

Fisch predicted a continuing and increasing relevance of Peirce for linguistics and that prediction seems to be proving true. Among those who take a neo-Piagetian constructivist approach to cognitive development there is an increasing enthusiasm for abandoning language dominated lin-

Peirce’s fourth Harvard Lecture see CP 5.111 (also EP 2:189). Also see Wible’s “Economics, Christianity, and Creative Evolution: Peirce, Newcomb, and Ely and the Issues Surrounding the Creation of the American Economic Association in the 1880s” (<http://www.cspeirce.com/menu/library/aboutcsp>).

¹⁷ According to Dearmont in discussion on the Peirce-L Forum.

¹⁸ In discussion on the Peirce-L Forum.

¹⁹ See Hanson (1958, 1961), for some of his early references to Peirce’s abduction. Also see Hanson (1965). For a collection of articles that surveys current research on abduction see *Semiotica* 153–1/4 (2005), a special issue on abduction: *Abduction: Between Subjectivity and Objectivity*.

guistics for a broader semiotic approach, one that takes seriously Peirce’s idea of pre-linguistic, or pre-symbolic, sign processing. This opens the way for a linguistic theory and, for that matter, a general theory of learning, that can account for a continuous development of cognitive functioning from the earliest stages of infancy to full intellectual maturity (see, e.g., Rodríguez & Moro, 1998; 2008). Somewhat more unexpected, perhaps, is the growing interest in applying Peirce’s complex sign analysis and classifications in radical reappraisals of received linguistic categories.²⁰

Fisch (1986, pp. 432–3) also discussed Milton Singer’s argument for a Peircean anthropology and the growing interest in Peirce on the part of sociologists and social psychologists. By 1973, through the work of John Lincourt and Peter Hare, Peirce was becoming recognized as having contributed, along with Chauncey Wright and Josiah Royce, to symbolic interactionism, the Chicago-based sociological movement centered on the idea that human life is lived principally in the symbolic domain. Since then much work has been done by philosophers like Vincent Colapietro (1989) and by sociologists like Norbert Wiley (1994) on Peirce’s social-semiotic theory of the self. This is an area that I believe is rich for future relevance, particularly as very new kinds of selves begin to emerge from the growing technologies that are bound to find unforeseen ways to connect brains, computers, data-bases, and proto-perceptive instruments into new kinds of conscious systems.²¹

Without wishing to neglect important areas of relevance and application, I’ll just briefly mention that Fisch also reviews Peirce’s growing relevance for psychiatry which, I believe, is yet to be fully comprehended, and for psychology, especially for the psychology of perception. Here is an area where theory and practice can be easily understood to walk hand in hand; those who struggle with the philosophy of perception understand very well how crucially the diagnosing and treating of perceptual deficiencies and abnormalities depends on the theory of perception embraced by the psychologist or psychiatrist. I believe it is the role Peirce gives to abduction in perception that is the crucial element that may eventually transform the way psychiatrists and psychologists understand perception and

²⁰ For example, see Andrew LaVelle’s “Metonymy: A Peircean Semiotic Categorization and Typologization in Relation to other Tropes and Sign Types,” PhD dissertation, University of New Mexico, 2007, and Anderson Vinícius Romanini’s “Minute Semeiotic; Speculations on the Grammar of Signs and Communication based on the work of C. S. Peirce,” PhD dissertation, University of São Paulo, 2006.

²¹ Also see N. Houser, “Form of Life to Come”, forthcoming in the *Balkan Journal of Philosophy*.

treat patients with perceptual problems (see, e.g., Houser, 2005; Muller & Brent, 2000; Rosenthal, 2004).

When Fisch glanced forward to Peirce's relevance for the future he made a special point of stressing the untapped potential of Peirce's normative thought, noting especially Peirce's neglected esthetics and ethics. Peirce's life-long investigation of standards, originally in connection with his interest in scientific measurement, provided a richly developed basis for axiological studies. As Kelly Parker has shown, Peirce was an early proponent of applying the conception of normativity to philosophy and by 1903 the normative sciences (identified by Peirce as aesthetics, ethics, and logic) had come to occupy the central ground of his philosophy (see Kent, 1987).²² Peirce's normative thought has received occasional attention over the years but recently there has been growing interest in his work in this area and it promises to be of increasing relevance in years to come.²³ I believe that one rich area for future study will be Peirce's regulative conception of value²⁴ and his idea that normative values grow, like everything else, though not in a way that can be reduced to biological evolution but more-or-less in the way that semiosis develops toward final interpretants.

Fisch quickly finished his forward glance without making many sustained predictions. Here is his final paragraph: "Philosophers will readily think of other questions equally worth pursuing, and now, like those above, about to become more readily pursuable. So also will inquirers coming to Peirce from mathematics, from the natural and social sciences, and from humanistic studies – say, for examples, from chemistry and physics, astronomy and geodesy, cartography and metrology; from anthropology and psychology, economics, history, and literature; from folklore, linguistics, and lexicography. The amazing range of his relevance we are only beginning to guess at. A decade from now we may have begun to measure and comprehend it." (Fisch, 1986, pp. 445–6).

²² See also Kelly Parker, *Charles S. Peirce on Esthetics and Ethics; A Bibliography*. (http://agora.phi.gvsu.edu/kap/CSP_Bibliography/)

²³ See, for example, Goudge (1950), and Thompson (1953). Of special importance among the earlier studies are the five papers (by the authors: Walter P. Krolkowski, S.J., Richard S. Robin, W. Donald Oliver, Roulon Wells, and Thomas A. Goudge) in the section on "Normative Science, Final Causation, and Evolution" in Moore & Robin (1964, pp. 257–341), and Potter (1967). One sign of growing interest in this area is the international conference held at the University of Opole, Poland, in 2007. The conference, organized by Krzysztof Skowroński and N. Houser, brought together thirty scholars from ten countries to discuss the growing relevance of Peirce's normative thought (see <http://www.filozofia.uni.opole.pl/show.php?id=78>).

²⁴ For the best discussion of Peirce's regulative theory of the normative value, truth, see Hookway (2004).

Well it is now three decades since Fisch tried to foresee Peirce's future relevance and we now know that in making his predictions he was remarkably prescient. Indeed, now we are much closer to comprehending the range of Peirce's relevance but of course it grows and shifts as science and culture evolve. Some of the more exciting new areas for applying Peirce, areas not already mentioned, where I see him beginning to be applied are ecology, biosemiotics, medicine, the theory of memes in cognitive science, management, critical editing, where Peirce's semiotics offers a way to maintain a respect for authorial intent, evolutionary religion, and the fine arts: painting, music, literature, and poetry. I anticipate that we will someday find a great poet to explore Peirce's categories in a profound and revealing way. The prospects for applying Peirce are legion – he was a polymath, after all, with a mind surprisingly open to possibilities.

In conclusion, I want to share a short verse that one of my students brought to my attention. He told me it was a poem by William Makepeace Thackery which he believed well-expressed the dynamics between thought, action, and habit, characteristic of pragmatism. Here is the verse:²⁵

Sow a thought, and you reap an act;
Sow an act, and you reap a habit;
Sow a habit, and you reap a character;
Sow a character, and you reap a destiny.

In this verse we have what seems to me to be a succinct expression of the development of character and destiny by way of thoughts, acts, and habits, that is quite Peircean. It is also a reminder that applied ideas are expressed in actions which do not entirely stop when they terminate; they may start tendencies or habits and in that way can have long-term consequences never imagined. As Peirce becomes more frequently applied in ways I've indicated and in ways treated by the participants of the Helsinki Conference, and by the growing company of students and scholars who are increasingly seeking direction from Peirce's thought, the destiny of human culture may, for some time to come, become more Peircean than Peirce could ever have hoped for – except perhaps briefly when he imagined that his *Guess at the Riddle* might launch a new age analogous to that begat by Aristotle.

²⁵ It turns out that this verse is unlikely to have been authored by Thackery. It is sometimes said to be a Buddhist Proverb and is attributed to at least nine different authors, including Thackery. Besides Thackery, the verse has been attributed to Charles Reade, Andre Maurois, Samuel Smiles, James Allen, George D. Boardman, Francis E. Willard, Ralph Waldo Emerson, and William James. The attribution to William James was apparently made because the verse was found in his hand, but I believe he was simply quoting it, presumably as my student did, as an expression of the dynamics within pragmatism.

References

- Baumol, W. J., & Goldfeld, S. M. (Eds.) (1968). *Precursors in Mathematical Economics: An Anthology*. London: London School of Economics.
- Beil, G.R., & Ketner, K.L. (2006). *A Triadic Theory of Elementary Particle Interactions and Quantum Computation*. Lubbock: Institute for Studies in Pragmaticism.
- Burks, A., & Burks, A. (1989). *The First Electronic Computer: The Atanasoff Story*. Ann Arbor: The University of Michigan Press.
- Cadwallar, T. C. (1974). "Charles S. Peirce (1839–1914): The First American Experimental Psychologist." *Journal of the History of the Behavioral Sciences*, 10, 293–296.
- Colapietro, V. M. (1989). *Peirce's Approach to the Self: A Semiotic Perspective on Human Subjectivity*. Albany: State University of New York Press.
- Eisele, C. (1979). *Studies in the Scientific and Mathematical Philosophy of Charles S. Peirce*. R. M. Martin (Ed.). The Hague: Mouton.
- Fisch, M. H. (1986). *Peirce, Semeiotic, and Pragmatism*. K. L. Ketner & C. J. W. Kloesel (Eds.). Bloomington: Indiana University Press.
- Goudge, T. A. (1950). *The Thought of C. S. Peirce*. Toronto: University of Toronto Press.
- Hanson, N. R. (1958). *Patterns of Discovery*. Cambridge: Cambridge University Press.
- Hanson, N. R. (1961). "Is There a Logic of Discovery?" In H. Feigl & G. Maxwell (Eds.), *Current Issues in the Philosophy of Science* (pp. 20–35). New York: Holt, Rinehart, and Winston.
- Hanson, N. R. (1965). "Notes Toward a Logic of Discovery." In J. Bernstein (Ed.), *Perspectives on Peirce* (pp. 42–65). New Haven: Yale University Press.
- Hookway, C. (2004). "Truth, Reality, and Convergence." In C. Misak (Ed.), *The Cambridge Companion to Peirce* (pp. 127–149). Cambridge: Cambridge University Press.
- Houser, N. (2005). "The Scent of Truth." *Semiotica*, 153(1/4), 455–466.
- Jakobson, R. (1959). "On Linguistic Aspects of Translation." In R. A. Brower (Ed.), *On Translation* (pp. 232–239). Cambridge, MA: Harvard University Press.
- Jakobson, R. (1965). "Quest for the Essence of Language." *Diogenes*, 51, 21–37.
- Jakobson, R. (1971). *Selected Writings, II: Word and Language*. The Hague: Mouton.
- Kent, B. (1987). *Charles S. Peirce: Logic and the Classification of the Sciences*. Kingston: McGill-Queen's University Press.
- Moore, E. C., & Robin, R. S. (Eds.) (1964). *Studies in the Philosophy of Charles Sanders Peirce* (Second Series). Amherst: The University of Massachusetts Press.
- Moore, M. E. (Ed.) (2010). *New Essays on Peirce's Mathematical Philosophy*. LaSalle, ILL: Open Court Publishing Co.
- Muller, J., & Brent, J. (Eds.) (2000). *Peirce, Semiotics, and Psychoanalysis*. Baltimore: The Johns Hopkins University Press.

- Potter, V. G. (1967). *Charles S. Peirce On Norms & Ideals*. Amherst: The University of Massachusetts Press.
- Putnam, H. (1982). "Peirce the Logician." *Historia Mathematica*, 9, 290–301.
- Quine, W. V. O. (1999). "A Tribute from the National Academy of Sciences." In K. L. Ketner & D. E. Pfeifer (Eds.), *Peirce Studies*, No. 6 (pp. 15–22). Elmhurst, IL: The Press of Arisbe Associates.
- Rescher, N. (1976). "Peirce and the Economy of Research." *Philosophy of Science*, 43, 71–98.
- Rodríguez, C., & Moro, C. (1998). *El mágico número tres. Cuando los niños aún no hablan*. Barcelona: Paidós.
- Rodríguez, C., & Moro, C. (2008). "Coming to Agreement: Object Use by Infants and Adults." In J. Zlatev (Ed.), *The Shared Mind: Perspectives on Intersubjectivity* (pp. 89–113). Amsterdam: John Benjamins.
- Rosenthal, S. B. (2004). "Peirce's Pragmatic Account of Perception: Issues and Implications." In C. Misak (Ed.), *The Cambridge Companion to Peirce* (pp. 193–213). Cambridge: Cambridge University Press.
- Short, T. L. (2007). *Peirce's Theory of Signs*. Cambridge: Cambridge University Press.
- Thompson, M. (1953). *The Pragmatic Philosophy of C. S. Peirce*. Chicago: The University of Chicago Press.
- Wible, J. R. (1994). "Charles Sanders Peirce's Economy of Research." *Journal of Economic Methodology*, 1, 135–160.
- Wiley, N. (1994). *The Semiotic Self*. Chicago: University of Chicago Press.