

DE GRUYTER
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*Torkild Thellefsen,
Bent Sørensen (Eds.)*

CHARLES SANDERS PEIRCE IN HIS OWN WORDS

100 YEARS OF SEMIOTICS, COMMUNICATION AND
COGNITION

SEMIOTICS, COMMUNICATION AND COGNITION

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Charles Sanders Peirce in His Own Words

Semiotics, Communication and Cognition



Editors
Paul Cobley
Kalevi Kull

Volume 14

Charles Sanders Peirce in His Own Words



100 Years of Semiotics, Communication and Cognition

Edited by
Torkild Thellefsen and Bent Sørensen

With a preface by Cornelis de Waal

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Foreword

Charles Sanders Peirce, born Sept. 10, 1839 – died April 19, 1914, was an original and versatile American scientist, logician, and philosopher. Today, he is, first and foremost, known as the founder of Pragmatism and modern semiotics (together with, of course, the Swiss linguist Ferdinand de Saussure (1857–1913)) (Nöth 1995: 39). But Peirce also made important discoveries within the fields of chemistry, optics, geodesy, astronomy, metrology, and psychology (as maybe the first American experimental psychologist (Cadwallader 1979)). Furthermore, Peirce is largely appreciated for his contributions to modern logic (Putnam 1982: 290–301) and the methodology of science as well as different branches of philosophy (Fisch 1986: 422–448). Peirce was a systematic philosopher (Murphey 1993; Anderson 1995a) – or an architectonic thinker, like Aristotle, Kant or Hegel – and in a draft to the book “A Guess at the Riddle” (c. 1898) he wrote the following:

Thus, in brief, my 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).

Peirce was trained in the chemical laboratory and was saturated with the spirits of the physical sciences (CP 1.3), but, inspired by the pre-Socratic philosophers, he also tried to understand the universe at large (CP 4.375), and he considered it to be permeated with signs and processes of signification (CP 5.448, note 1; CP 4.551). Hence, Peirce defended a pan-semiotic view of the universe; to him, the universe was a great argument, simply and solely (CP 5.119), and thereby intelligible or reasonable (CP 1.615; Potter 1997: 202; Sørensen, Thellefsen & Brier 2012: 106-117). The universe can be known by man; and man can only think and communicate by signs (CP 5.251), himself, in fact, being a sign (CP 7.583; Singer 1984: 53–73). Therefore, Peirce saw the urgent need for developing a thorough-going theory of signs, a semiotic, and in a letter from 1908 to the English philosopher of language, Lady Victory Welby (1837–1912), he looked back on his intellectual preoccupation and stressed how:

... it has never been in my power to study anything, – mathematics, ethics, metaphysics, gravitation, thermodynamics, optics, chemistry, comparative anatomy, astronomy, psychology, phonetics, economics, the history of science, whist, men and women, wine, metrology, except as a study of semiotic. (SS: 85–6).

To Peirce, semiotic furthermore provided a general framework concerning his logical studies and his methodology of science; it was even central in his pursuit of finding a proof for his Pragmatism, and, thus, during the course of more than

fifty productive years, he managed to develop a series of broad, deep, and complex semiotic concepts and methodologies (see Greenlee 1973; Savan 1987; Johansen 1993; Liszka 1996; Short 2007a).

At the beginning of the twentieth century, the American philosopher, Josiah Royce (1855–1916), studied and was influenced by the semiotics of Peirce, and in Europe Peirce was introduced by Charles K. Ogden (1889–1957) and Ivor A. Richards (1893–1979), in their classic of semantics “The Meaning of Meaning” from the year 1923. Later, during the 1930s and 40s, in the field of general semiotics, Charles Morris (1901–1979) pursued a Peircean heritage, and influenced Rudolf Carnap (1891–1970) and thereby the Unity of Science Philosophers enough to recognize the importance of a systematic inquiry into signs, leading to their use of the triadic division of “syntax, semantics, and pragmatics” (Houser 2009: 89). Later again, during the 1960s, 70s, and 80s, the semiotic world witnessed the linguistic discovery of Peirce’s theory of signs by Roman Jakobson (1896–1982), Umberto Eco (1936–) gave the sign-typology of Peirce (icon, index, and symbol) a firm place within the structuralist framework of semiotics (Nöth 1993: 40), and Max Bense’s (1910–1990) Stuttgart School of Semiotics – founded on Peircean principles – proposed a framework for the study of texts. Furthermore, Thomas Sebeok (1920–2001) believed that (Peircean) semiotics should be an interdisciplinary field of research and as a tireless organizer of international conferences, an editor, and through numerous of publications he worked to realize this ambition (Cobley, Deely, Kull & Petrilli 2011).

With the introduction of new and better editions of Peirce’s writings during the last 20 to 30 years, his reputation has continued to grow and Peirce’s theory of signs is probably the most frequently examined of the foundational theories of semiotics today. This is demonstrated by a growing number of articles, books, and conferences on Peirce’s semiotics and by increasing references made by researchers and scholars coming to Peirce from mathematics, the natural and social sciences, and the humanistic studies as well. It seems safe to assume that many treasures still wait to be unearthed from the manuscripts of Peirce that will influence the development of semiotics as well as a wide range of other disciplines.

This year is the 100-year anniversary of the death of Charles Sanders Peirce. With the present volume we wish to commemorate the anniversary and help to further the advancement of scholarship on Peirce’s thought concerning semiotics, communication and cognition.

Ninety-one Peirce-scholars from twenty countries located on four continents have been asked to select a favorite quotation from Peirce and provide their scholarly comment on it. The scholars come from a variety of disciplines – e.g., philosophy, logic, mathematics, media science, and biology – and they provide

their comments in different forms: from strict exegesis and explication placing the quote in a historical context, to critique, to seeing the quote as a starting point or source of inspiration for particular conceptual developments. However, each article in this volume, in one way or another, points towards the relevance and potential of Peircean thought for contemporary studies within semiotics, communication, and cognition. The articles are structured in chronological order and cover an intellectual time span of nearly 48 years, starting with the earliest quote from 1863 and ending with the latest quote from 1911.

As a preface to the volume, Cornelis de Waal, PhD, of the University of Indiana, provides the reader with a brief overview of seminal publications within the first century of Peircean scholarship. De Waal's historical tour takes its point of departure in Peirce's papers (especially "The Collected Papers of Charles Sanders Peirce" and "The Writings of Charles S. Peirce") and from there he discusses, more broadly, Peirce scholarship. Over the years the output on Peirce has grown exponentially – spreading from North America to Europe and the Latin countries – and has ventured in many directions, also directions of relevance to semiotics, communication and cognition. Hence, de Waal concludes that the study of Peirce is alive and well – or in the words of Peirce himself we might say: "symbols grow".

Bent Sørensen & Torkild Thellefsen
Aalborg, Denmark, 2014

Preface by Cornelis de Waal

This book is published 100 years after the death of the American polymath Charles Sanders Peirce (1839–1914) to celebrate the first century of scholarship on his work. A mathematician by breed, chemist by training, physicist by profession, and philosopher-logician by temperament, Peirce found himself at the center of numerous key developments in the nineteenth century, and sought to contribute pretty much to them all. He was a pioneer in mathematical logic and semiotics, used gravity to determine the shape of the earth, wrote on Shakespearean pronunciation, engaged in experimental psychology, studied the magnitude of stars, wrote several books on logic and mathematics (none of which were published), gave lectures on the history of science, developed a bleaching process for wood pulp, wrote on spelling reform, made calculations for a suspension bridge, and in a brief letter to his former student Alan Marquand invented the electronic switching-circuit computer. None of these accomplishments really helped him, however. Removed from academia – apart from a brief stint at Johns Hopkins – he had no students that could carry his torch further. On 19 April 1914, he died in abject poverty and almost completely forgotten in a small town called Milford, Pennsylvania. Childless, he was survived only by his widow, Juliette Peirce, a frail woman of unknown origin. Upon her death she was buried with Peirce’s ashes in a simple grave among the servants of the Pinchot family.

The editors of this volume have chosen to celebrate the first century of Peirce scholarship by asking a variety of scholars to select a quotation of Peirce that they found important, insightful, or inspiring in relation to the following three concepts: semiotics, communication and cognition, and explain their choice. In this preface, however briefly, I will take a different and I think complementary approach by commemorating the first century of Peirce scholarship, which includes the work of many who are no longer among us. This is undoubtedly a foolish if not impossible undertaking, as in such a brief space I cannot do justice to everyone and I’m bound to be ignorant of the accomplishments of many. In an attempt to somewhat remedy this I will concentrate on the history of the Peirce papers and use this as my guide while discussing Peirce scholarship more broadly.¹ I think this is justified, as by far the greatest accomplishment of the first century of Peirce scholarship is the thirty-volume chronological edition of the writings of Peirce, even though less than a third of the projected volumes have appeared so far. The task that this and other editions of Peirce’s writings

¹ An extensive account of the history of the Peirce papers is found in Nathan Houser, “The Fortunes and Misfortunes of the Peirce Papers”, in *Signs of Humanity*, edited by Gérard Deledalle (Berlin: Mouton de Gruyter, 1992) 3: 1259–68.

face is a particularly daunting one, as Peirce got but a fraction of what he wrote into print. It is also an important one, as it is among the stuff that Peirce failed to publish that one often finds his most interesting ideas. Hence, it would not be inappropriate to call the first century of Peirce scholarship the archeological age and detail some of that archeology here.

The story begins with a younger contemporary of Peirce, the American philosopher Josiah Royce. Especially after the turn of the century Peirce exerted a significant influence on Royce, who would read from letters he received from Peirce in the seminars he taught at Harvard. Keenly aware of the trove of material that could be found in Peirce's elaborate mansion in Milford, Royce arranged for Peirce's manuscripts and his library to be sent to Harvard. That the manuscripts would go to Harvard, or anywhere else for that matter, was by no means a given. In fact, most of what did not go to Harvard – and this presumably included Peirce's extensive collection of notecards – was burned in a large bonfire following Juliette's death and the subsequent sale of their mansion.

It took Royce considerable effort to scrape together \$500 (the equivalent of \$12,000 today), which enabled him to buy Peirce's books and manuscripts from Juliette. The books and papers arrived at Harvard in January of 1915, which is less than a year after Peirce's death. Their arrival at Harvard also signals the beginning of Peirce scholarship, as it inaugurates the first attempt at rearranging the fragmented and disorganized manuscripts with the aim of distilling from them an edition of Peirce's most significant writings. It would take more than fifteen years before this would come to fruition with the publication of the first six volumes of the *Collected Papers*.

Consulting the bibliography of secondary works, compiled by Christian Kloesel and Joseph Ransdell, for the period preceding the *Collected Papers*, nets very little.² The high points are Morris Cohen's 1923 anthology *Chance, Love, and Logic*, Ogden and Richard's 1923 *The Meaning of Meaning*, which contains a fairly extensive discussion of Peirce's semiotics, and C.I. Lewis's 1918 *A Survey of Symbolic Logic*, which assigns to Peirce a key role in the development of symbolic logic. Peirce is discussed, albeit briefly, by John Maynard Keynes in his *Treatise of Probability* (1921), more extensively by Max Scheler in *Die Wissensformen und die Gesellschaft* (1926), and he surfaces in a handful of works on pragmatism, including Georges Sorel's *De l'utilité du pragmatisme* of 1921. In 1916, the *Journal of Philosophy* published a commemorative issue on Peirce, containing five essays and a provisional bibliography of his published works. An anonymous supple-

² Kenneth I. Ketner et al (1986). *The Published Works of Charles Sanders Peirce, with a Bibliography of Secondary Studies*. Bowling Green: Philosophy Documentation Center.

mentary bibliography of Peirce's equally anonymous *Nation* reviews appeared two years later in the same journal.

The first six volumes of the *Collected Papers*, edited by Charles Hartshorne and Paul Weiss, were published in the early 1930s. The volumes brought a sizeable selection of Peirce's unpublished work before the reading public. However, with the manuscripts still in substantial disarray and significant restrictions on space (the Harvard manuscripts are estimated at over a hundred thousand pages) the task was nearly impossible and the result suffered because of it.

Despite their deficiencies, the *Collected Papers* were put to good use. In the quarter century following their publication two popular anthologies appeared, both relying on *Collected Papers* texts: Justus Buchler's 1940 *Selected Writings* and Philip Wiener's 1958 *Values in a Universe of Chance*. In addition, at least ten substantial monographs on Peirce appeared (of which one in German and three in Italian), over fifty dissertations with in-depth analyses of a wide variety of aspects of Peirce's thought, and a significant number of journal articles. In 1946, to further encourage the study and development of Peirce's ideas, the Reverend Frederic Young founded the Charles S. Peirce Society.³ The first outcome of this enterprise was a cooperative volume that Young edited with Philip Wiener, *Studies in the Philosophy of Charles Sanders Peirce*, which appeared in 1952 and is still considered a classic. In 1953, Irwin Lieb published a small booklet of Peirce's letters to Victoria Lady Welby.

At the end of the 1950s two more volumes of the *Collected Papers* came out, this time edited by Arthur Burks, and Max H. Fisch was asked to write a biography of Peirce to capstone the edition. Fisch quickly discovered that he could not write an intellectual biography unless he could follow the trajectory of Peirce's thought through the six decades that he was active as a thinker. This, however, required putting the manuscripts in chronological order rather than divvying them up thematically as the editors of the *Collected Papers* had done. Hence, as a precursor to writing the biography, Fisch embarked, with Richard Robin, Don Roberts, and Carolyn Eisele, on a large-scale reordering of the manuscripts, the one hundred thousand pages mentioned above. Fisch's hope that the manuscripts could be ordered chronologically, proved too optimistic, and they ended up settling for a thematic organization, as the *Collected Papers* had done, albeit more fine-grained. The two main outcomes of this enterprise were a 39-reel microfilm published by Harvard University Library, which contains most of the papers and correspondence held at Harvard, and Richard Robin's 1967 *Annotated Catalogue of the Papers of Charles S. Peirce*, which is a finding aid to both the

³ See Peter H. Hare, "In Memoriam: Frederic Harold Young (1905–2003) and the Founding of the Peirce Society", *Transactions of the Charles S. Peirce Society* 40.3 (2004): 393–415.

archival collection and the microfilm. Robin's *Catalogue* and the Harvard microfilm opened up Peirce's unpublished writings far beyond what had been made available through the *Collected Papers*. According to WorldCat, fifty-six libraries worldwide own a copy of the microfilm, and that is most likely a conservative number. None of this was much help to Murray Murphey, however, who also maintained that the best way to study Peirce was to do so chronologically, something he did in his 1961 *The Development of Peirce's Philosophy*.

After publishing a second *Studies in the Philosophy of Charles Sanders Peirce*, in 1963, this time edited by Richard Robin and Edward C. Moore, the Peirce Society launched its own journal, the *Transactions of the Charles S. Peirce Society*, of which the first issue appeared in 1965 under the editorship of Edward Moore.⁴ Over the years the *Transactions* – for most of its history under the editorship of Richard Robin and Peter Hare – developed into an influential journal in American philosophy. Today, it counts more than 3,000, mostly institutional subscribers, and its articles are downloaded close to 40,000 times a year. At the end of the 1960s, also the International Association for Semiotic Studies was formed, together with its flagship journal *Semiotica*, which Thomas Sebeok edited until his death in December 2001.

Besides Murphey's seminal work on the development of Peirce's philosophy, the 1960s produced John Boler's *Charles Peirce and Scholastic Realism*, Hjalmar Wennerberg's *The Pragmatism of C. S. Peirce*, Thomas Knight's *Charles Peirce*, Richard Bernstein's anthology *Perspectives on Peirce*, Karl Popper's *Of Clouds and Clocks* (in which he lamented not having known Peirce's work earlier), Vincent Potter's *Charles S. Peirce on Norms and Ideals*, Robert Almeder's *The Metaphysical and Logical Realism of Charles Sanders Peirce*, and A.J. Ayer's *Origins of pragmatism* which, fortunately perhaps, never had the impact of his *Language, Truth, and Logic*. We also see the first books on Peirce's semiotics: Douglas Greenlee's *Peirce's Concept of Sign*, and John Fitzgerald's *Peirce's Theory of Signs as Foundation for Pragmatism*. And that's only English-language activity. We see books appear in Swedish, Polish, Italian, German, Russian, and French. In German also appeared a two-volume edition of Peirce's texts, translated by Gert Wartenberg and with a foreword by Karl-Otto Apel. Searching for Peirce in WorldCat and in The Philosopher's Index shows that the 1960s gave birth to the same number of theses and dissertations as journal articles (about 90 each), and that of the latter over half were published in the *Transactions*. Overall, we can say that the 1960s show a significant surge in Peirce scholarship, and that we see the pioneering phase of Peirce scholarship coming to an end.

⁴ On the foundation of the *Transactions*, see Peter H. Hare, "Richard S. Robin: Present at the Creation", *Transactions of the Charles S. Peirce Society* 38.1/2 (2002): 1–6.

High-points of the 1970s include Carolyn Eisele's five-volume *New Elements of Mathematics*, an edition that exceeds the *Collected Papers* in size, the four-volume *Charles Sanders Peirce: contributions to The Nation*, edited by Kenneth Ketner (et al.), a new edition of Peirce's correspondence with Victoria Lady Welby, and the *Comprehensive Bibliography Index of the published works of Charles Sanders Peirce* (with a microfiche edition of Peirce's published works), both also edited by Ketner. In 1971 Ketner founded the first research institute on Peirce, The Institute for Studies in Pragmaticism, and in 1976 the Peirce Bicentennial International Congress was held in Amsterdam, where over fifty papers on Peirce were presented.

The number of books on Peirce went up quite a bit during the seventies. They include Don Robert's work on existential graphs, R.M. Martin's *Peirce's Logic of Relations*, K.T. Fann's book on abduction, Carolyn Eisele's *Studies in the Scientific and Mathematical Philosophy of Charles S. Peirce*, Nicholas Rescher's work on Peirce's philosophy of science, Karl-Otto Apel's *Der Denkweg von Charles Sanders Peirce*, David Savan's introduction to Peirce's semiotics, Gérard Deledalle's *Théorie et pratique du signe*, and Gert Wartenberg's *Logischer Sozialismus*. Part of this took place within the context of an increased interest in pragmatism overall, as well as a growing interest in (Peircean) semiotics.

In the 1980s the first volumes of the *Writings* began to appear under the editorship of Max Fisch and others. After decades of work, the manuscripts were now sufficiently sorted out to begin an edition of Peirce's work that is chronological, and which Fisch felt was needed to write an intellectual biography of Peirce. This edition, which is still ongoing, also includes Peirce's scientific work and utilizes significant archival collections besides Harvard's, including the National Archives and the Open Court Collection. In the mid 1980s Carolyn Eisele published a two-volume gathering of Peirce's science-related writings in *Historical Perspectives on Peirce's Logic of Science*. Also in the 1980s, the Toronto Circle began its studies in Peirce's semiotic, which proved symptomatic of a significant growth in work on Peirce's semiotics during the decade. Books that appeared in the eighties include David Savan's *Introduction to C. S. Peirce's full System of Semeiotic*, Christopher Hookway's *Peirce*, Beverly Kent's work on Peirce's classification of the sciences, Douglas Anderson's *Creativity and the Philosophy of C.S. Peirce*, Victorino Tejera's *Semiotics from Peirce to Barthes*, Robert Almeder's *The Philosophy of Charles S. Peirce*, Peter Skagestad's *Road of Inquiry*, Roberta Kvelson's *Law as a System of Signs*, Joseph Esposito's book on Peirce's evolutionary metaphysics, Michael Raposa's *Peirce's Philosophy of Religion*, Vincent Colapietro's *Peirce's Approach to the Self*, and Max Fisch's collection of essays, *Peirce, Semeiotic, and Pragmatism*. At the end of the decade, in 1989, The Charles S. Peirce Sesquicentennial International Congress took place at Harvard,

a large five-day affair that spun off several at times bulky anthologies, such as *Studies in the Logic of Charles Sanders Peirce*, edited by Nathan Houser et al.

In the 1990s an edition of Peirce's 1898 Cambridge Conference Lectures appeared, edited again by Ketner, and another of the 1903 Harvard lectures, edited by Patricia Ann Turrisi. Concurrently, the two-volume *Essential Peirce* brought a key selection of texts, responsibly edited, to a wider audience. The first English-language biography appeared in 1993: Joseph Brent's *Charles Sanders Peirce: A Life*, based on Brent's 1960 dissertation. The biography – which is highly controversial, in part because it boldly declares Peirce mentally ill – is still the only full biography in the English language. Earlier, shorter biographies came out in German, by Elizabeth Walther, and in French, by Gérard Deledalle.

The 1990s also inaugurated a shift to electronic, web-based research and its dissemination. In August 1993, Joseph Ransdell launched Peirce-L, an on-line public forum for the discussion of Peirce's life and work, with a focus on his philosophical thought. The list has since developed into a mayor web portal for Peirce scholarship, named Arisbe. A year later, in 1994, Jaime Nubiola created the *Grupo de Estudios Peirceanos* at the University of Navarra to promote the study of Peirce in Spain and Latin America. Its website too developed into a veritable hub for Peirce scholarship, in part by making freely available Spanish translations, by Sara Barrena and others, of Peirce's writings.

Work in the 1990s included Richard Smyth's *Reading Peirce Reading*, James Liszka's general introduction to Peirce's semeiotic, Cheryl Misak's *Truth and the End of Inquiry*, James Hoopes' *Community Denied*, the multiple works of Thomas L. Short, Mats Bergman, Floyd Merrell, Michael Shapiro, and Roberta Kevelston, Peter Ochs' *Peirce, Pragmatism, and the Logic of Scripture*, Carl Hausman's *Charles S. Peirce's Evolutionary Philosophy*, Jørgen Dines Johansen's *Dialogical Semiosis*, Frederik Stjernfelt's *Diagrammatology* and many others. In fact, a new era had begun where it is no longer feasible for the average Peirce scholar to read everything that appeared, and in which the study of Peirce was finding more and more inroads in a wide variety of disciplines, from tort law to quantum mechanics and beyond – a process that is still ongoing today.

To briefly conclude this all too brief historical tour through the first century of Peirce scholarship, all signs indicate that at the eve of the celebration of one hundred years of Peirce scholarship the study of Peirce is alive and well. Over the years the output on Peirce has grown exponentially and has ventured in many directions. According to the Philosopher's Index, which admittedly gives only a very limited picture, most importantly because it does not index the main journals in semiotics, list 521 papers on Peirce for the first decade of the 21st century alone. Of these 143 were published in the *Transactions*, and 85 in the Brazilian journal *Cognitio: Revista de Filosofia*, which established itself during

the decade as an important journal for Peirce studies, drawing partly on an annual conference held in São Paulo. Over the same period *Semiotica* published 80 papers on Peirce. All of this shows that Royce's \$500 investment in bringing the Peirce papers to Harvard has most definitely paid off. And it is only the beginning. For a preview to the sequel I wholeheartedly invite you to read the pages that follow. They are more than worth it.



W. H. Allen

Table of contents

Foreword — v

Preface by Cornelis de Waal — ix

Charles Sanders Peirce – Primary Sources and Abbreviations — xxv

Leon J. Niemoczynski

1 **Aesthetic Value in Peirce’s Theistic Naturalism — 1**

Susan Petrilli

2 **Man, Word, and the Other — 5**

Fernando Andacht

3 **Semiotic Gold at the End of Peirce’s Rainbow: on the Fallible Pursuit of Reality — 13**

Rosa M. Calcaterra

4 **Testimony and the Self — 21**

Robert Lane

5 **Against Pretend Doubt — 27**

Ivan Mladenov

6 **Motion and Thought – a Generic Metaphor — 33**

Sami Pihlström

7 **Peirce on Realism and Nominalism: the Metaphysics and Ethics of a Community of Inquirers — 39**

Yvan Beaulieu

8 **Peircean Inquiry and Secret Communication — 45**

Cheryl Misak

9 **Peirce on Non-Accidental Causes of Belief — 53**

Henrik Rydenfelt

10 **Scientific Method and the Realist Hypothesis — 57**

Gary Richmond & Ben Udell

11 **Logic is Rooted in the Social Principle (and vice versa) — 63**

- John R. Shook
12 Reasoning is Communal in Method and Spirit — 73
- Robert E. Innis
13 The Bottomless Lake of Consciousness — 81
- Kalevi Kull
14 Physical Laws are not Habits, while Rules of Life are — 87
- Terrence W. Deacon
15 Semiosis: from Taxonomy to Process — 95
- Donna Orange
16 Is Peirce's Fallibilism an Ethical Attitude? — 105
- Maria de Lourdes Bacha
17 Peirce's Fallibilism in the Context of the Theory of Cognition and the Theory of Inquiry — 109
- Ahti-Veikko Pietarinen
18 Diagrams or Rubbish — 115
- Victoria N. Alexander
19 How does Cognition come from Chance? — 121
- Kelly A. Parker
20 Peirce's Graph of "a Sort of Equilateral Hyperbola" — 127
- Daniel Chandler
21 Icons and Indices Assert Nothing — 131
- Nathan Houser
22 Bohemians, Like Me — 137
- James Jakób Liszka
23 Peirce's Evolutionary Thought — 145
- Winfried Nöth
24 Peirce's Guess at the Sphinx's Riddle: The symbol as the Mind's Eyebeam — 153
- Michael L. Raposa
25 Love as Attention in Peirce's Thought — 161

- Rossella Fabbrichesi
26 A Person is Like a Cluster of Stars — 165
- Mathias Girel
27 Crystal-Clearness: For the Second-Rates — 169
- Phyllis Chiasson
28 On the Nature of Rare Minds & Useless Things — 177
- David L. O'Hara
29 The Heart as a Perceptive Organ — 187
- Iris Smith Fischer
30 On the “Realistic Hypostatization of Relations” — 193
- Irving Anellis
31 Peirce’s Role in the History of Logic: Lingua Universalis and Calculus Ratiocinator — 201
- Søren Brier
32 Pure Zero — 207
- Paul Forster
33 Peirce on Theory and Practice — 213
- Tomis Kapitan
34 Peirce and the Discipline of Metaphysics — 221
- Amy L. McLaughlin
35 Peirce’s First Rule of Reason and the Process of Learning — 229
- Floyd Merrell
36 Bridging Ancient and Contemporary Knowing — 235
- Helmut Pape
37 Peirce’s Process Ontology of Relational Order — 239
- Eugene Halton
38 The Degenerate Monkey — 245
- Mi-Jung Kang
39 On Digital Photo-Index — 253

- Tyler James Bennett
40 Semiotic Propedeutics for Logic and Cognition — 259
- Anne Freadman
41 The First Correlate — 263
- Catherine Legg
42 Logic, Ethics and the Ethics of Logic — 271
- Rosa Maria Mayorga
43 Beauty and the Best — 279
- Joao Queiroz & Pedro Atã
44 Iconicity in Peircean situated cognitive Semiotics — 283
- Peter Skagestad
45 The Purloined Inkstand — 291
- Frederik Stjernfelt
46 A Very Short Version of Diagrammatic Reasoning — 295
- Cornelis de Waal
47 Against Preposterous Philosophies of Mind — 297
- Douglas Anderson
48 Dream and Drama: Peirce's Copernican Turn — 305
- Marco Annoni
49 Words that Matter: Peirce and the Ethics of Scientific Terminology — 309
- Mats Bergman
50 The Curious Case of Peirce's Anthropomorphism — 315
- Elizabeth F. Cooke
51 Peirce and the "Flood of False Notions" — 325
- Diana B. Heney
52 Peirce on Science, Practice, and the Permissibility of 'Stout Belief' — 331
- Risto Hilpinen
53 Logic, Time, and Knowledge — 335

- Tony Jappy
54 The Hypoicons — 339
- Liuhua Zhang
55 The Phenomenon of Reasoning — 347
- Douglas Niño
56 Peirce's Abduction — 353
- Frank Nuessel
57 Terminology and Scientific Advancement — 359
- Sami Paavola
58 Fibers of Abduction — 365
- Torill Strand
59 Experience and Education — 373
- John J. Stuhr
60 Peirce, Pragmatism, and Purposive Action — 379
- Patricia Turrisi
61 Peirce's Method of Work — 385
- Paul Cobley
62 Metaphysics of Wickedness — 393
- Daniel J. Brunson
63 A Pragmaticist Appreciates the Past — 399
- Dinda L. Gorrée
64 Peirce's Logotheca — 405
- Jesper Hoffmeyer
65 Animals use Signs, They just don't know it — 411
- Robert Marty
66 A Purely Mathematical Way for Peirce's Semiotics — 415
- Torjus Midtgarden
67 Pragmatism, Cultural Lags and Moral Self-Reflection — 421

Ludwig Nagl

- 68 Peirce on Hegel, Pragmatism, and “the Triadic Class of Philosophical Doctrines” — 429**

Jaime Nubiola & Sara Barrena

- 69 Science as a Communicative Mode of Life — 437**

Augusto Ponzio

- 70 Not an Individual, but a dual Self (at least) — 443**

Andrew S. Reynolds

- 71 Science and Metaphysics — 451**

Lucia Santaella

- 72 The Semiosphere: A Synthesis of the Physio-, Bio-, Eco-, and Technospheres — 457**

James Wible

- 73 Peirce’s Persistent Interest in Economics — 465**

Shannon Dea

- 74 The River of Pragmatism — 475**

Priscila L. Farias

- 75 Visualizing Reason — 483**

Vincent Colapietro

- 76 Self-Control, Self-Surrender, and Self-Constitution: The Large Significance of an “Afterthought” — 487**

Marcel Danesi

- 77 The Peircean Concept of Existential Graph and Discovery in Mathematics — 493**

Bent Sørensen & Torkild Thellefsen

- 78 Peirce on Metaphor — 503**

Priscila Borges

- 79 Peirce’s System of 66 Classes of Signs — 507**

Charles G. Conway

- 80 Peirce’s Philosophical Theology, Continuity, and Communication with the Deity — 513**

- Patrick J. Coppock
81 The Play of Musement — 521
- Priscila L. Farias & João Queiroz
82 On Peirce’s Visualization of the Classifications of Signs: Finding a Common Pattern in Diagrams — 527
- Francesco Poggiani
83 Truth and Satisfaction: The Gist of Pragmaticism — 537
- Yunhee Lee
84 Collateral Experience and Interpretation: Narrative Cognition and Symbolization — 545
- Giovanni Maddalena
85 “Don’t You Think So?” — 553
- Bent Sørensen, Torkild Thellefsen & Martin Thellefsen
86 Collateral Experience as a Prerequisite for Signification — 557
- Richard Kenneth Atkins
87 Comparing Ideas: Comparational Analysis and Peirce’s Phenomenology — 561
- Vinicius Romanini
88 Developing from Peirce’s Late Semeiotic Realism — 569
- References — 575**
Index — 601

Charles Sanders Peirce – Primary Sources and Abbreviations

The references to Peirce’s works are abbreviated in compliance with the Commens web site¹.

Abbreviation	Description
CN followed by volume and page.	<i>Charles Sanders Peirce: Contributions to The Nation</i> . 4 Vols. Kenneth L. Ketner and James E. Cook, eds. Lubbock, 1975–87.
CP followed by volume and paragraph number.	Collected Papers of Charles S. Peirce (1931–58). 8 vols. Ed. By C. Hartshorne and P. Weiss (vols. 1–6), and A. Burks (vols. 7–8). Cambridge, MA: Harvard University Press.
EP followed by volume and page number.	The Essential Peirce. Selected Philosophical Writings. Vol. 1 (1867–1893), edited by Nathan Houser & Christian Kloesel, 1992, vol. 2 (1893–1913), edited by the Peirce Edition Project, 1998. Bloomington and Indianapolis: Indiana University Press.
HPPLS followed by volume and page.	<i>Historical Perspectives on Peirce’s Logic of Science</i> . 2 Vols, ed. Caroline Eisele. The Hague, 1985.
NEM followed by volume and page number	<i>The New Elements of Mathematics</i> , by Charles S. Peirce. Four volumes in five books. Edited by Carolyn Eisele (1976). The Hague: Mouton Publishers.
MS followed by number	“MS” refers to the microfilm edition of the manuscripts of C.S. Peirce in Richard S. Robins <i>Annotated Catalogue of the Papers of Charles S. Peirce</i> , University of Massachusetts Press, Boston, 1967).
PM	<i>Philosophy of Mathematics: Selected Writings</i> . Ed. Matthew Moore Bloomington, 2010.
R followed by Robin Catalogue and sheet number.	Manuscripts held in the Houghton Library of Harvard University, as identified by Richard Robin. <i>Annotated Catalogue of the Papers of Charles S. Peirce</i> . Amherst, 1967, and in Richard Robin “The Peirce Papers: a supplementary catalogue”, <i>Transactions of the C.S. Peirce Society</i> 7 (1971): 37–57.
RTL	<i>Reasoning and the Logic of Things: The Cambridge Conference Lectures of 1898</i> . Ed. Kenneth L. Ketner. Cambridge, Mass., 1992.

¹ www.helsinki.fi/science/commens/aboutcommens.html

Abbreviation	Description
SS followed by page	Semiotic and Significs: The Correspondence Between Charles S. Peirce and Victoria Lady Welby. Ed. by Charles S. Hardwick & J. Cook (1977) Bloomington: Indiana University Press.
W followed by volume and page number.	The Writings of Charles S. Peirce. 6 vols. to date. Vol. 1, edited by Max Fisch et al., vol. 2, edited by Edward C. Moore et al., vols. 3–5, edited by Christian Kloesel et al., vol. 6, edited by the Peirce Edition Project. Bloomington: Indiana University Press, 1980–2000.

Leon J. Niemoczynski¹

1 Aesthetic Value in Peirce's Theistic Naturalism

A man looks upon nature, sees its sublimity and beauty and his spirit gradually rises to the idea of a God. He does not see the Divinity, nor does nature prove to him the existence of that Being, but it does excite his mind and his imagination until the idea becomes rooted in his heart. In the same way, the continual change and movement in nature, suggests the idea of omnipresence. And finally, by the events of his own life, he becomes persuaded of the relation of that Being with his own soul. (W1: 108–109, 1863).

The above quote was taken from Charles S. Peirce's "The Place of Our Age in the History of Civilization", an oration delivered at the reunion of the Cambridge High School Association during the month of November in the year of 1863. The point of the address closely follows its title – to address the age, *Peirce's age* – of the 18th, and 19th centuries, but also to track "the plot of history" on a "grand scale" (W1: 108).

Throughout the lecture Peirce references, alongside advances made by the sciences, the role that religion has occupied throughout the course of history. The quote under scrutiny here is of especial importance, as Peirce's remarks about religion (historical or otherwise) are few and scattered among his large body of work. While there certainly has been a recrudescence of interest in Peirce's philosophy of religion, and while specifically focusing on Peirce's philosophy of religion alone could be one way to begin this entry, it is usually best to first aim for a broader context in studying Peirce's outlook before focusing on a particular instance of his thinking (in this case with Peirce, his philosophy of religion as it is situated within his larger architectonic). However, with space constraints in mind, I hope that the reader shall permit me to focus on just one salient feature of Peirce's outlook, which seems to me to be most pertinent to the above quote. That salient feature is Peirce's affinity for science. What shall quickly become apparent is that Peirce was no ordinary scientist. Rather, a religious or theistic view shaped his scientific thinking in the form of a profound theistic naturalism. And I believe that the above quote precisely identifies what is most important in Peirce's theistic naturalism with respect to his scientific view: the notion that the natural world studied by science is imbued with an aesthetic value intrinsically tied to the formation of religious belief.

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During the early 1860s, when Peirce composed the address from which the above quote was taken, two things are sure: he was suffering terribly due to trigeminal neuralgia, and his religious outlook was intertwining ever more tightly with his scientific outlook. Joseph Brent writes in his Peirce biography, *Charles Sanders Peirce: A Life* (1998), that these were times when Peirce was suffering deep bouts of depression due to the pain caused by his neurological condition. The suffering was for Peirce, unbearable – or, as Peirce put it, “There are few ailments which give rise to greater suffering” (Brent 1998: 40). Prone to terrible pain and depression, Peirce infused himself with decoctions of opium and alcohol as he overworked himself. At times he was cold, aloof, and stupefied, yet at other times he had manic outbursts of temper (suggesting a manic-depressive illness) (Brent 1998: 40). This is remarkable given that, despite his manic and driven side, his paranoia, and his impulsive actions, he nevertheless maintained a commitment to a form of scientific query aimed at uncovering a universe pervaded by a living, developing, and personalized form of intelligence: the mind of God or “Absolute Mind”. This Absolute Mind could best be characterized not only by its developing intelligence, but also, as Peirce tells his readers in the essay, “Evolutionary Love” (1893), by its affinity for connection, synthesis, and love. Immediately one is struck by a tension: the horror of suffering and the idea of a pervasive, loving God endowed with “absolute mind” or intelligence. Yet Peirce saw mind and heart – science and religion – as being intertwined: two closely knit outlooks upon one nature. Given his personal trials, how was this possible?

Benjamin Peirce, Charles’ father, was a scientist by training who was influenced in two fairly significant ways by the Swedish mystic Emmanuel Swedenborg. These influences appear to have carried over to affect his son, Charles. First, following Swedenborg, Peirce’s father seems to have influenced his son in thinking that nature was the exemplar of a “Divine Geometer”, where science and mathematics are the means to discovering that mind’s wisdom (Murphey 1961: 13). For example, Benjamin Peirce taught that mathematics was a kind of “Pythagorean prayer” and that the supernatural existed within the natural (Brent 1998: 33). As Murphey clarifies, for the Peirces, “The discovery of the true structure of reality through science was therefore more than a possibility: it was religious duty” (Murphey 1961: 15). The Peirces thus believed that nature was “divine ideality” and that the various laws and processes of nature were incarnations of the divine mind, part of its “divine record” (Raposa 1989: 8). Or, as Peirce put it, “such a state of mind may properly be called a religion of science . . . It is a religion, so true to itself, that it becomes animated by the scientific spirit” (CP 6.433). So while Peirce’s father’s Unitarianism did not rub

off on him, his father's view that how nature (the domain of science) was also "God's great poem", did.

The second way that Benjamin influenced Charles was that he followed Swedenborg's doctrine that "evil is a good because it challenges us to become spiritually whole" (Brent 1998: 38). And so Charles, while suffering terribly, was still to find some element of goodness and virtue in his work because he understood that suffering was simply a part of the divine incarnation. Living with the divine incarnation in all of its guises was part of his religious duty. Therefore, following to some degree Schelling in accepting evil as part of nature's naturing, Peirce stated that "Whatever is is best" (MS 970: 11ff) and that evil ought to be regarded as "one of the perfections of the universe" – that is, while evil is evil, it is still perfectly part of nature (CP 6.479). Of course, such statements may sound strange, but when they are situated within Peirce's aesthetic theory – a theory crafted under the influence of German romanticism and idealism (whether Schelling or Hegel: both of whom Peirce would only begrudgingly admit as influential for him, or Schiller: whose aesthetics Peirce embraced at the "tender age of 16") (W1: 10–12) – their meaning becomes more intelligible.

For Peirce, evil and "the existence of pain" normatively appear to "harmonize beautifully" within a universe that is slowly being "worked out" (MS 843: 32ff). Aesthetically, evil (better understood in the more fundamental aesthetic sense of discord, as *ethics* is a species of *the aesthetic*) does have its place in an evolving cosmos where creatures who are aware of goodness, harmony, and connection must also know what is not good (what is discordant) in order for metaphysical contrasts to be obtained. In terms of aesthetics (the immediacy of qualitative experience) and the aesthetic's relationship to the "absolute mind" of God, it is still possible for the divine reality to become present even where evil – or discord or ugliness – appears first to be (see MS 283: 43). In other words, while humans may perceive evil, its appearance seems necessary for there to be a real contrasts of value present. Thus Peirce will not deny the reality of evil (especially as it appears to human eyes); however he shall maintain that eventually good will "win out" (MS 843: 32ff).

As much as the divine may appear within what humans perceive as evil, the divine may also appear through what is beautiful and sublime. As Peirce writes, "A man looks upon nature, sees its sublimity and beauty and his spirit gradually rises to the idea of a God. He does not see the Divinity, nor does nature prove to him the existence of that Being, but it does excite his mind and his imagination until the idea becomes rooted in his heart". In essence, here Peirce foreshadows his theory of musement as it is expressed in his 1903 essay, "A Neglected Argument for the Reality of God". Given a process of free play, the mind muses upon the beauty of the world and, sensing its connections and syntheses, alights

upon an idea of God (CP 6.458). In the same way, taking suggestion from the motions of nature, science, too, tends to follow spontaneous forms of abductive inference performed within the aesthetic *Spieltrieb*, striking upon principles of explanation. In the case of the former those principles are religious in their orientation, and in the case of the latter they are scientific. Both may begin within aesthetic experience.

Now, Peirce finishes his thought in this quotation that the personal relationship to God may be guided and tested within the course of events constituting one's own life, but there is no steadfast or readymade argument that could *prove* the existence of this Being any more than science can infallibly *prove* the eternal nature of physical laws which govern the universe. But this Being, "Absolute Mind" or God, can very well *persuade* or *gently lure* one into welcoming its reality within one's heart either through the course of life's event or by the presentation of astounding facts. Each constitutes the "divine incarnation".

The religious connotations of Peirce's aesthetics can inform, I think, present and future research in fairly significant ways. It may be highly instructive to balance Peirce's penchant for science with his view that the aesthetic of the natural world may actually serve as stage for the formation of religious belief. As the natural world is the domain of science, Peirce's aesthetic (and the value he finds in that aesthetic) is thus the basis for his "scientific theism", or perhaps more adequately put in this context, his "theistic naturalism". In short, for Peirce the natural world studied by science can be understood as being imbued with an aesthetic value that is tied to the formation of religious belief where such belief is not antithetical to science but rather serves as its "animating spirit".

Susan Petrilli¹

2 Man, Word, and the Other

When I communicate my thought and my sentiments to a friend with whom I am in full sympathy, so that my feelings pass into him and I am conscious of what he feels, do I not live in his brain as well as in my own – most literally? True, my animal life is not there but my soul, my feeling thought attention are. . . . Each man has an identity which far transcends the mere animal; – an essence, a *meaning* subtle as it may be. He cannot know his own essential significance; of his eye it is eyebeam. But that he truly has this outreaching identity – such as a word has – is the true and exact expression of the fact of sympathy, fellow feeling – together with all unselfish interests – and all that makes us feel that he has an absolute worth. (CP 7.591, 1866).

1. This passage is from Vol. VII, *Science and Philosophy*, of the *Collected Papers of Charles Sanders Peirce*, edited by Arthur W. Burks, 1958. As stated in the “Preface”, after Vol. VI appeared in 1935, it did not seem possible to publish a subsequent volume. Selection, preparation, and publication of further material was at that time impractical and for the next twenty years the remaining papers in Harvard’s custody were accessible exclusively to such scholars as could consult them in Cambridge. Only in 1954 was the Harvard Department of Philosophy able to renew the enterprise with the help of Rockefeller. The project was entrusted to Professor Arthur W. Burks, University of Michigan. Permission was obtained to print a letter from Peirce to William T. Harris; and texts from James Mark Baldwin’s *Dictionary of Philosophy and Psychology*, Vol. II; *The Nation* (several reviews); *Popular Science Monthly* (Peirce’s review of Pearson’s *Grammar of Science*; parts of two letters reprinted from Irwin C. Lieb’s *Charles S. Peirce’s Letters to Lady Welby*); William James, correspondence; and quotations from a Peirce manuscript, “Questions on William James’s Principles of Psychology” (previously published in Ralph Barton Perry’s *Thought and Character of William James*). Hence volume VIII was added, containing selections from Peirce’s reviews and correspondence and a bibliography of his published works.

CP VII is organized in three books: Book I. *Experimental Science*; Book II. *Scientific Method*; Book III. *Philosophy of Mind*. The passage chosen is located in Book III, precisely Chapter 4, §6. *Consciousness and Language* (CP 7.579–596). It continues thus:

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Each man has his own peculiar character. It enters into all he does. It is in his consciousness and not a mere mechanical trick, and therefore it is by the principles of the last lecture a cognition; but as it enters into all his cognition, it is a cognition of *things in general*. It is therefore the man's philosophy, his way of regarding things; not a philosophy of the head alone – but one which pervades the whole man. This idiosyncrasy is the idea of the man; and if this idea is true he lives forever; if false, his individual soul has but a contingent existence. (CP 7.595)

Gentlemen and ladies, I announce to you this theory of immortality for the first time. It is poorly said, poorly thought; but its foundation is the rock of truth. And at least it will serve to illustrate what use might be made by mightier hands of this reviled science, logic, *nec ad melius vivendum, nec ad commodius disserendum*. (CP 7.596)

2. The topic relative to this part of Vol. VII of the *Collected Papers* relates to the semiotics of the self, a recurrent topic in my research *à propos* Peirce, focused on cognition, interpersonal communication and moral value. The semiotics of self, of personal identity that can be drawn from Peirce ideally develops across three fundamental stages: 1) writings from the years 1867–1868, published in *The Journal of Speculative Philosophy*, and characterized by interpretation of the human conscious in a semiotic key: “whenever we think, we have present to the consciousness some feeling, image, conception, or other representation, which serves as a sign” (CP 5.283); 2) five articles published in the journal *The Monist* beginning from 1891. In them Peirce introduces the doctrine of tychism, synechism and agapism, develops his evolutionary cosmology, and works on the theory of the human person; and 3) three more recent writings on “pragmaticism” which unite developments in both Peirce’s cosmology and his semiotic theory (Colapietro 1989).

In CP 7.591 Peirce begins by observing that he had thought a lot about the analogy between a man and a word, and was taking it up again in relation to the questions of the “reality of mind” and of the “immortality of the soul”. In CP 5.313 (Some Consequences of Four Incapacities, *Journal of Speculative Philosophy*, II, 1868: 140–57), Peirce states that “the mind is a sign developing according to the laws of inference”. And to the question, continuing in the same paragraph, “What distinguishes a man from a word?”, after listing obvious and unquestionable differences, he observes that “there is no element whatever of man’s consciousness which has not something corresponding to it in the word; and the reason is obvious” (CP 5.314). And he adds: “It is that the word or sign which man uses is the man himself. For, as the fact that every thought is a sign, taken in conjunction with the fact that life is a train of thought, proves that man is a sign; so, that every thought is an external sign, proves that man is an external sign” (CP 5.314).

For Peirce, the self is a sign; it converges with the verbal and nonverbal language it uses. The self is made of language and is inconceivable without language. Even more, the self, indeed as Peirce claims, man is a word. Man exists in terms of the interpretant-interpreted relationship; to interpret is to think and to think is to speak, with oneself and with others. Thanks to the word, the self is not only a semiotic process, but also a semiotic process². Through enunciative/interpretative engagement the prospect in development of meaning itineraries (the open-ended chain of interpretants) is potentially infinite. As Peirce says, addressing the dilemma as to whether it is man who makes the word or the word that makes man – which evokes the egg and chicken puzzle, and in reality corresponds to the same question concerning the relation between interpreted and interpretant – “men and words reciprocally educate each other; each increase of a man’s information involves and is involved by, a corresponding increase of a word’s information” (CP 5.313). Peirce then goes on to specify that “the man and the external sign are identical, in the same sense in which the words *homo* and *man* are identical. Thus my language is the sum total of myself; for the man is the thought” (CP 5.314).

But what I most wish to evidence here are the implications of such considerations not only for cognition and the relation between the I who interprets and its other, its self, or I/interlocutor, but also in the relation with the other from self, the external other, that is, on the level of communication with others. This is why I have started from where Peirce speaks of communicating one’s thoughts and feelings to a friend (CP 7.591). In this process not only can we ascertain that the other has understood correctly, but we can also feel what the other feels as a result of this communication.

Not only do I feel what I myself experience, but I also feel what the other experiences. I am inside myself, inside my body, inside my space-time, with my

² The term “semiotic” or “semiosical” is the adjective for semiosis, a sign process, situation or relation. Semiosis is the subject matter of semiotics, just as the psyche is the subject matter of psychology, the social of sociology, the biological of biology, etc. Charles Morris states that “Semiotic as the science of semiosis is as distinct from semiosis as is any science from its subject matter” (Morris 1971 [1949]: 23). Morris himself distinguishes between three dimensions of semiosis, the *semantical*, *syntactical* and *pragmatical*. To these three correspond the three dimensions of semiotics – semantics, syntactics and pragmatics. Like all other animals, the human animal is a “semiotic animal”, it lives on signs. But unlike other animals, the human animal can also reflect on signs, talk about signs, suspend immediate semiosis and deliberate. In this sense the human animal is also a “semiotic animal” (Deely, Petrilli, Ponzio 2005; see Petrilli and Ponzio 2005). Therefore, we can distinguish between two meanings of the term “semiotics” (which Morris spells without an “s”): 1) the practice each human individual as a human individual is capable of; 2) the general science of signs, which is possible thanks to this specific human capacity (see also Sebeok 1991, 1994, 2001; Petrilli 2010, 2012, 2013; Ponzio 1990).

own value-system and, simultaneously, I share in the spatial-temporal architectonics and axiology of others, as though endowed with the gift of ubiquity. This is the word's ubiquity, ubiquity of thought and of the word. Man is not a thing; as such he does not answer to the "barbarian notion according to which a man cannot be in two places at once" (CP 7.591). "A word may be in several places at once . . . ; and I believe – Peirce adds – that a man is no whit inferior to the word in this respect" (CP 7.591).

Communication does not only involve messages transiting from a source to a destination, but listening, the possibility of encounter with the other, the possibility for the self to conceive a new word, never uttered before, not only to others, but not even to itself; a word said, thought, conceived solely and uniquely as a word to this other here, "a friend, with whom I am in full sympathy" (CP 7.591). Such that like a word, I can "live in his brain as well as in my own" (CP 7.591).

A man's identity transcends his physical being, the condition of mere corporeity, understood in a physical sense, but also his organic, animal identity. This has led to investing man with a soul, with the gift of immortality (which Peirce addresses in the paragraphs subsequent to CP 5.451). Each man's identity is not only outreaching towards the outside understood as the surrounding environment, but also towards the other from self, towards the other man, just like the word, indeed precisely because man is a word. Thanks to the word we can communicate with the other in terms of sympathy, empathy, *Einführung*, "together with all unselfish interests" (CP 7.591); and it is the word that "makes us feel that [man] has an absolute worth" (CP 7.591).

And if man is immortal (the topic of immortality enters Book III, *Philosophy of Mind*, in Vol. VII of *CP*, inclusive of our initial quote), this is not because of the soul – which man is supposedly endowed with beyond the body – but the word.

Insofar as it is a sign, a sign in evolution, the I/self emerges as a relational and dialogical entity, as an open subject, in becoming in the intrapersonal and interpersonal interrelation with other signs and subjects.

The human mind, the I, the self, what we could indicate as the I/self, is at any given instance a phenomenal manifestation, a sign in becoming according to the laws of inference. Thought is inferential as is meta-thought which elects thought as the object of analysis. The subject becomes conscious of its personality through the same mechanisms with which it becomes conscious of others. Both processes are characterized by dialogism.

Given the common characteristic of being made of words and the condition of internal and external otherness, the difference between the self and the other, as in the case of two distinct people, does not in itself obstacle the possibility of understanding and responsiveness to the feeling and thought of the other.

Access to the other *of* myself is not essentially different to access to the other *from* myself. The I is not only I for the self, but also I for the other. This is structural to the idea that the I has of the self, such that the I's identity forms in the relation with the other. Vice versa, the other is not only the other on its own account, but the other for self; not only the effective other, but also the imaginary other; not only the other *from* self, but also the other *of* self – the self that maintains its otherness with respect to interpretations, identifications, and to self-consciousness, coming to awareness, all of which engage and constitute the I/self.

Insofar as man is a sign, a word, the boundaries of the I/self are not defined once and for all. They are not delimitable if not relatively to dialogic encounter with other signs and subjects: what we call “experience” cannot belong to the I/self considered in isolation:

... we know that man is not whole as long as he is single, that he is essentially a possible member of society. Especially, one man's experience is nothing, if it stands alone. If he sees what others cannot, we call it hallucination. It is not “my” experience, but “our” experience that has to be thought of; and this “us” has indefinite possibilities. (CP 5.402)

Rather than the “personality”, the “*personal self*”, the “*individual self*” understood as a self defined and finalized once and for all, Peirce theorizes a self interconnected with other selves. The finite self, the “*personal self*” is an “illusory phenomenon”, even if a good dose of egocentrism leads one to believe in the possibility of separating oneself from the other and to the extent that one believes this, the conditions are created for such delusory isolation. In reality, as results from the principle of continuity, or *synechism*, every point in the semiotic flux is connected with every other, such that the I/self cannot be totally split and isolated from the other. On the basis of the principle of *synechism* Peirce commits to a conception of personal identity that is all but reductive. He describes three types of consciousness, the *carнал* which constitutes just a small part of man, the *social* such that the self of personal identity is incarnated in the I of others, and the *spiritual* which makes of the human person an “eternal truth incorporated in the universe” (cf. CP 7.565–578), a manifestation of its laws. From this perspective, not only is a human totally separate from the other not possible; but, even more, far from guaranteeing uniqueness or integrity of the single individual, isolation obstacles realization of the I/self's specificity, its alterity with respect to the alterity of others. The I/self is connected to community involvement even in the most “intimate” and “unique” experiences, so that what matters and should be thematized, what confers and generates sense, is not “my” experience, but “ours”. In CP 5.317, Peirce characterizes the individual closed in its egotism and self-exaltation like this:

The individual man, since his separate existence is manifested only by ignorance and error, so far as he is anything apart from his fellows, and from what he and they are to be, is only a negation.

This is man,

“... proud man,

Most ignorant of what he's most assured,

His glassy essence”.

(Shakespeare, *Measure for Measure*, II: 2)

The communitary aspect of self is not extrinsic. The self does not enter into contact with others as a unit, preestablished and predefined. As sign material the I/self is internally, structurally dialogic, a community of dialogically inter-related I/selves (CP 5.421).

The I/self is an incarnate subject involving intercorporeity, sociality, history psychic activity, dialogue. As such, the expressions “the self is in thought”, “we are in thought” contrast with the implications of expressions like “thoughts are in us”, “we have thoughts”. The latter is mistaken in the same way that to say “motion is in a body” instead of “a body is in motion” is mistaken: “... just as we say that a body is in motion, and not that motion is in a body we ought to say that we are in thought and not that thoughts are in us” (CP 5.289, n.1). Cognition or representation, conscious, psychic activity generally are achieved in the relation between one psychic state and another in the continuity of semiotic fluxes.

As a dialogical process, the self is a self in becoming, a continuous, open-ended process, never complete in itself. Continuity involves temporality (CP 6.155–157). Semiotically speaking, the self is projected into its future interpretants, interrelatedly and in communication with other selves and signs. The I/self is not only oriented towards the future; in any given moment it also reinterprets and reinvents itself with respect to the past and the present. This possibility is inscribed in the specificity of the self as a sign, in its specificity as *metasemiotic semiosis*, as semiosis on semiosis and self-consciousness.

The capacity for metasemiosis involves a continuous doubling of the self in interpretant and interpreted: there is no I without its self, there is no sign “I”, the interpretant, without the sign “self”, the interpreted. The relation between interpreted and interpretant is never of convergence, superimposition, identification. The self's identity is constituted in the I/self metasemiotic process which involves interpretation and excludes identification. The I/self is a communicative event, modeled in signs. Dialogical exchange among interlocutors already imposes continuous role exchanges from speaker/utterer to listener/interpreter. Discourse is never one's own, but resounds in the discourse of others, in sociality.

The relation between humility and fragility of the I/self, on one side, and readiness to risk venturing towards the other, on the other side, is depicted in Plato's myth (in *Symposium*) about Eros – a sort of intermediary divinity or demon, generated by Penia (poverty, need) and Poros (God of ingenuity) – who knows how to find the way even when obstructed. Peirce can be associated to this myth when he maintains that communication from one mind to another occurs through continuity of being, a process in which the miserable individual disappears; and man is capable of accepting the role assigned to him in the theatre of creation. For Peirce “the great principle of logic” is “*self-surrender*”. “Self-surrender” does not mean that the self must lay low to reach final triumph, and should this occur, this goal is not the rule (CP 5.402, n. 2). Self-surrender orients the relation with the other, the capacity to surrender to the other, to take a listening position and experience the other. Humility, the capacity to put aside one's miseries, one's delusory “*individual*” identity, is the condition that renders creativity possible and together the departure point for the great adventure towards the other.

Fernando Andacht¹

3 Semiotic Gold at the End of Peirce's Rainbow: on the Fallible Pursuit of Reality

The third principle whose consequences we have to deduce is, that, whenever we think, we have present to the consciousness some feeling, image, conception, or other representation, which serves as a sign. But it follows from our own existence (which is proved by the occurrence of ignorance and error) that everything which is present to us is a phenomenal manifestation of ourselves. This does not prevent its being a phenomenon of something without us, just as a rainbow is at once a manifestation both of the sun and of the rain. When we think, then, we ourselves, as we are at that moment, appear as a sign.
(CP 5.283, 1868).

The quote that I chose for this anthology of possible entries into Peirce's thought appears in "Some consequences of four incapacities" (henceforth, *Consequences*), one of three "anti-Cartesian" papers published in 1868 in the *Journal of Speculative Philosophy*. These texts are also known as the "cognition series" and this is but one indication of their importance. In the 'Introduction' to Volume 2 of the *Writings* edition, Fisch (1984: xxvii) claims that together with Peirce's 1867 "New List", and the 1871 review of Berkeley's works, these texts "are now recognized as constituting the modern founding of semeiotic, the general theory of signs, for all the purposes of such a theory". That is a big claim, and my aim is to bring out the relevance of this issue for present day epistemological debates, and to do so by furnishing support of Fisch's assessment of the importance of that small set within the large *Nachlass*, and of the quote drawn from *Consequences*, the second article to appear the cognition series. There are epistemological and metaphysical matters in it that Peirce condenses with the colorful metaphor to which my title alludes and which leads to the following queries: what kind of realism is the one claimed for triadic semiotic?; why does it matter that the subjective/objective aspects of our knowledge be tightly woven in and through the action of signs or semiosis?; could we argue for an *ante litteram* formulation of synechism in this early text?²

What is clear in this quote and in the other texts that allegedly constitute "the modern founding of semeiotic" (Fisch 1984) is a cogent expression of Peirce's *hope* in the power of our inferential process to establish a long term access to reality and truth as complementary upshots of inquiry. His claim is that we get

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² The term appears and is defined in 1892, in "The Law of mind" (CP 6.103).

to know the real insofar as we rely on the signs derived from our experience, which Peirce considers to be steeped in generality/Thirdness. Therefore, we must abstain from splitting phenomena in “unrelated chunks of being”, which is how dualism works (CP 7.570). Instead of severing the subjective element – our idiosyncratic ways as fallible semiotic agents – from the objective realm, the world out there, Peirce’s rainbow image furnishes an alternative, synechistic vision of this epistemic matter.

Last but not least, implicit in the quote there is teleology, the alleged “intellectual club foot” as Ransdell (1997) ironically puts it: an aspect of semiotic to which one should not pay attention let alone comment upon. Indeed, this seems too big a burden to lay on such a slight textual material, so many key concepts compressed in one paragraph from the early years of the semiotic. To illustrate the quote’s contemporary significance, I will contrast the implications and consequences of Peirce’s anti-Cartesianism with W. James’s take on representation as it is presented in one of the popular lectures he gave in 1906–1907 at the Lowell Institute and Columbia University and published in the book *Pragmatism: A New Name for Some Old Ways of Thinking*. I will argue that this fellow traveller of the philosophy whose creation he credits to Peirce describes sign action in dualistic, anti-semiotic terms. There is an intellectual kinship, I think, between James’s position and the now popular ‘social construction of reality’ (Hacking 1999). The latter disseminates a theory that I believe to be “most hostile to synechism” (CP 7.570). Ironically, the true postmodern epistemological perspective is Peirce’s, writes Deely, because he defends logical continuity, while many self-described postmodern thinkers share the modern assumption that “only the mind’s own constructions are said to be known” (2003: 89).

A road that leads hopefully and semiotically to the end of the rainbow of the real

I will now consider the textual scaffolding that paves the road for the *Consequences* article, and that develops into the mature statement of the semiotic years later. In the 1868 manuscript “Questions on reality”, we find the sketch of what was elaborated by Colapietro’s (1989) book on the self-notion as it appears throughout Peirce’s work. Peirce defines the self as accident prone in its cognitive endeavors; it is an uncertain stage where fallible encounters with the world take place and where it learns the crucial distinction between beliefs and what turns out to be the case, or in Peircean terms, appearances vs. testimony: “Thus (the child) adds to the conception of appearance as something other than fact,

the conception of it as *private*, as connected with some one body. In short, *error* appears and it can be explained only by supposing a *self* which is fallible". (W2: 169) The way in which testimony occurs is through signs; signs enable us to transcend personal misconceptions, without the need of "an intuitive power of self-consciousness" (*ibid.*), writes Peirce in anti-Cartesian terms. It is a bold analytical move to posit the emergence of human identity as an upshot of our fallible ways of knowing the world and on the corrections that we receive from the community. The distinction between 'appearances' and 'testimony' prepares the way for an assertion in the quote of *Consequences* that could be misunderstood for an idealistic or social constructionist position,³ namely, the claim that everything that we perceive is but "a phenomenal manifestation of ourselves". However, this text includes a reference to our fallibilism, which should not be read as a pessimistic or relativistic claim, but as the very basis of our hope of attaining the truth through mediation.

On this hope the entire semiotic building rests, as Peirce describes it in quasi-religious terms, in the 1871 Berkeley review, and in his 1903 "Lectures on Pragmatism", when he argues for the cooperative working of all three phaneroscopic categories in experience:

But the *saving truth* is that there is that there is a Thirdness in experience, an element of reasonableness to which we can train our own reason to conform more and more. If this were not the case, there could be no such thing as logical goodness or badness; and therefore we need not wait until it is proved that there is a reason operative in experience to which our own can approximate. *We should at once hope that it is so*, since in that *hope* lies the only possibility of any knowledge. (CP 5.160 – emphasis added, F.A.)

Despite the religious overtones of Peirce's expression of faith in the growth of "concrete reasonableness" (CP 2.34) and in our duty to further it "whenever it is 'up to us' to do so" (CP 1.615), its main purport is to convey the reliability of the logical/semiotic *metabolism* of the real.

In another manuscript of that year, "Potentia ex Impotentia", Peirce comments on the first article of the cognition series: "Our experience of any object is developed by a process continuous from the very first, of change of the cognition and increase in the liveliness of consciousness" (W2: 191). This hint at what would become synechism prepares the way for the rainbow metaphor, an iconic sign of the unbroken blend of light and water that produces that physical phenomenon. Similarly, in experience, the external and internal come together through sign mediation in an evolving mixture of error and truth that only time and self-criticism are able to refine.

³ According to which reality is 'the mental construction of those who believe they have discovered and investigated it' (Turrisi 2002: 126).

Chronologically, we arrive now to the 1868 *Consequences* article from which I drew the quote. As a good pragmatist, Peirce (W2: 223) announces that he will attempt to “deduce the consequences” of the “third principle”. He refers to one of the four critiques of Cartesianism in “Questions concerning some Faculties claimed for man”, namely, “We have no power of thinking without signs” (W2: 213). The following claim is a key consequence of this principle: “cognizability (in its widest sense) and being are not merely metaphysically the same, but are synonymous terms” (W2: 208). A corollary of Peirce’s strong claim is that to be and to be known are but the two aspects of the same phenomenon, and the price for the endless inquiry which is indistinguishable from life is to err. What saves us from cognitive despair is the hope of arriving at a more reasonable end of inquiry than the point from which we began. To posit representability and being as equivalent ways of construing any phenomenon is the main thrust of the rainbow metaphor: without both elements at work, “the sun and the rain”, there would be no rainbow in the sky. Far from reality being an arbitrary projection of our own minds, an apotheosis of the subjective, a state of affairs in which our cognition would only be caused by some kind of “aesthetic satisfaction”, which Peirce calls an exaggeration “of the element of Firstness” (CP 5.160), his claim is that on both sides of the cognitive process, the same categoreal elements are operative. And that is the solid epistemological basis of his logical hope.

I will go now to one of the developments of the rainbow quote. Three years later, in Peirce’s 1871 Review of Berkeley’s edition by Fraser, there is a rhetorical strategy which resembles the rainbow metaphor, but which is less vivid iconically. Its purport is quite clear: triadic semiotic, the path of signs and generality, and *not* nominalism’s narrow road of singulars is the right road to know the real. In this passage, there are two metaphors that are undergoing a process of fossilization, so their analogical power is somehow inferior to that of the rainbow image. Peirce asserts that mankind will eventually reach “a *catholic* consent” about “external things which can be known only as exerting a power on our sense”, because “there is a general *drift* in the history of human thought which will lead it to one general agreement” (W2: 469–470). Despite the endless cognitive mishaps to which we imperfect creatures are prone, there is a unanimous, *universal* right conclusion awaiting those who have a genuine desire to attain knowledge, and this Peirce calls “a consensus”, “a common *confession*” (W2: 471, emphasis added, F.A.).

The two mildly metaphorical terms – one underlines universality (‘catholic’), the other a common creed (‘confession’) – hark back to the rainbow image: nothing prevents our private or personal signs of the world, those “present to the consciousness”, from being also “a phenomenon of something without us” (W2: 223).

Another religious word used by Peirce (CP 7.334) in this connection, at that time (1873) is 'fate', which Mayorga (2007: 98) equates to synechism as the "power" that will lead us unerringly, albeit in the long run, to the truth of any matter of inquiry. Also related to the import of the rainbow metaphor is what Peirce presents in the Berkeley review as the "doctrine of immediate perception" (W2: 471) upheld by a realist (like him). Ransdell (1986: 58–59) suggests that "direct perception" would be more suitable, as "all perception is mediated in the sense of being representative" (ibid.). Shrewdly, Peirce brings to light a metaphor that is ingrained in the dualistic way we think of mind as a container where we store things:

(The realist) will not sunder existence out of the mind and being in the mind as two wholly improportionable modes. When a thing is in such relation to the individual mind that that mind cognizes it, it is in the mind; and its being so in the mind will not in the least diminish its external existence. For he does not think of the mind as a receptacle, which if a thing is in, it ceases to be out of. (W2: 471).

Just as water and light mingle in a rainbow, in our experience, the world and the self are synechistically connected through the action of signs and the categories on which it is based: "To make a distinction between the true conception of a thing and the thing itself is . . . only to regard one and the same thing from two different points of view; for the immediate object of thought in a true judgment is the reality" (W2: 471). In the context of the quote I chose, Peirce (W2: 223) equates those who think with signs: "we ourselves, as we are at that moment, appear as a sign". Therefore the tri-relative influence of semiosis serves to define them: a thinker also has "three references", an interpretant, an object, and a sign "*in some respect or quality*".⁴ All the elements of a full-fledged communication theory are here – and not only a human one. We can imagine a Möbius-like diagram of Peirce's account of the process of knowledge: there is no clean cut division of outside/inside, only the flowing action of signs on both sides. It is now time to revisit a very different construal and metaphor of cognition, that proposed by Peirce's friend and fellow pragmatist, William James.

Counterpoint between the encompassing rainbow and the alarming digestion of signs

For the sake of fairness, before quoting the passage where I claim that William James gives an account of sign activity that is antithetical to Peirce's, I should

⁴ This is called "the ground" in an often quoted definition of sign (CP 2.228). For a discussion see Andacht (1998).

mention that a scholar considers the 1906–07 lectures which then became James’s classic book on Pragmatism a low point in the philosopher’s brilliant intellectual career. Wilshire (2010: 105) calls him “a tragic figure” and wonders “Why would he give the lectures? Why would he dumb down his thought and throw away his hard-earned reputation?” The reason for choosing this text is that it provides an enlightening contrast with what I have presented as Peirce’s consistent realist and synechistic construal of the semiotic and of its cognitive purport. Far from having gone unheeded as a minor lapse in the history of thought, endless variations of James’s account of representation have taken root in the nominalist theories of meaning which have grabbed the imagination of social scientists nowadays.⁵

In “Pragmatism and Humanism”, the seventh lecture that James gave to an overflowing audience at Columbia, he offers a metaphorical account that is akin to the theories developed in the second half of the 20th century by post-structuralists and radical social constructionists. Though I lack any textual evidence, I think that Peirce would have rejected it for the same reason.

In the rhetorical climax of this lecture, which overtly deals with Schiller’s brand of ‘Humanism’, James (1907) describes a most exasperating experience which it is our fate as human beings to suffer in the hands of our representations, which I dare say play the role of a malevolent trickster:

[Reality] is what is absolutely dumb and evanescent, the merely ideal limit of our minds. We may glimpse it, but we never grasp it; what we grasp is always some substitute for it which previous human thinking has peptonized and cooked for our consumption. If so vulgar an expression were allowed us, we might say that whatever we find it, it has been already *faked*. (95–96 – emphasis in the original).

Let us leave aside for a moment the philosophical background of these ideas, and focus only on James’s rhetorical formulation, which is that of a convinced pragmatist, one who belligerently opposes “rationalism” (99). Nevertheless, his claim denies thoroughly the anti-nominalist, synechistic principles of Peirce’s realist semiotic. Not only, says James, “we never grasp” reality, but worse than that, when reality eventually reaches us through signs (“some substitute of it”), it has already been digested beyond repair or reliable recognition. To use James’s physiological metaphor, the real has been “peptonized”, digested, irreversibly dissolved by semiotic enzymes to such an extent that when we come upon their object, in someone’s signs of it (“human thinking”), reality “has

⁵ Hacking presents a detailed and informative discussion of the popular rise of social constructionism, whose basic tenet he sums up thus: “it is urged that a great deal (or all) of our lived experience, and of the world we inhabit, is to be conceived as socially constructed” (1999: 6).

already been *faked*". In sharp contrast with the epistemological hope forcefully expressed by Peirce, with his logical faith in a community's reaching a "catholic consent" or a "common confession which constitutes reality" (W2: 471) through semiosis in the long run, James's version is akin to the agony of Tantalus: when we think we are about to witness ("testimony") what signs reveal of the real, all we can ever get is worthless misrepresentations of it. Instead of the teleological drive which leads us fallibly towards the real, James's account ends in a complete divorce from the real, an isolated mind. In that passage, there is a crescendo of frustration concerning the essentially misleading way of signs: we only catch a glimpse of the real, what we grasp has already been digested, and then cooked thereby losing all epistemic value. If Peirce's is a hopeful inquiry that increases our self-control through the handling of signs of the world effectively, James's analysis is that of a useless, frustrating endeavor that could be compared to a solipsist semiotic maze. Four decades later, the neo-Kantian Cassirer (1944: 25) describes a similar disheartening picture, when he presents our symbolic activity as inevitably locking us in a prison-house of signs:

No longer can man confront reality immediately; he cannot see it, as it were, face to face. Physical reality seems to recede in proportion as man's symbolic activity advances. Instead of dealing with the things themselves, man is in a sense constantly conversing with himself.

This 'Midas touch' of human sign activity renders unreal whatever it comes in contact with; it fosters the very opposite of what Peirce described consistently as a most lively sign-based dialogue and communion with all there is, including what we imagine about the world and ourselves, because "Signs (are) the only things with which a human being can, without derogation, consent to have any transaction, being a sign himself" (CP 6.344).

Rosa M. Calcaterra¹

4 Testimony and the Self

... testimony is even a stronger mark of fact than the facts themselves, or rather than what must now be thought of as the appearances themselves. (I may remark, by the way, that this remains so through life; testimony will convince a man that he himself is mad) (EPI: 19–20, 1868).

This passage, which appears in the basic 1868 essay *Questions Concerning Some Faculties Claimed for Man*, provides an emblematic feature of Peirce's rejection of the Cartesian paradigm of modern mentalist approaches to epistemological problems, namely of the epistemologies centered on the human consciousness/mind's structure. This essay is dedicated to the critique of the epistemological value of immediate intuition – both of the senses and of intellect – showing the traditional search for an absolute primum of knowledge as a pseudo-problem. In this context, the operational value of testimony is offered in relation to the problem of the recognition of the “*private* self” (W1: 18) and comes out as a multifaceted piece of the typically Peircean interweaving of externalism with fallibilism.

Peirce's basic claim is that a cognitive faculty of intuition would properly consist in “an intuitive power of distinguishing an intuition from another cognition”, but there are a number of relevant cases for questioning such a power. In particular, it must be considered that an agreement on self-evident truths has never been reached in the history of philosophy. Moreover, it is not sufficient to take our *feeling* of having an intuitive power as evidence for its real existence since this very feeling could be “the result of education, old associations” or it may depend “on presupposing the very matter testified to” (EPI: 12). Most importantly, Plato's paradigmatic suggestion of the epistemic priority of ‘first person’ accounts of facts² seems to be at stake: “Every lawyer knows how difficult is for a witness to distinguish between what they have seen and what they have inferred” (EPI: 13–14). The challenge to the epistemic reliability of the testimony based on feelings or on personal reconstruction of sensorial experience is coherent with Peirce's claim that “testimony gives the first drawing of self-consciousness” (EPI: 20), and that this event coincides first and foremost with the acknowledgment of the fallibility of the individual self (*ibid.*). These claims are based on a psychological analysis, according to which the genesis of self-

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² See Plato (1921): 221.

consciousness arises from the particular phase of psychic development of the child corresponding to the phase of “learning to understand a language”, when the child “begins to converse” (EPI: 19). The crucial point of Peirce’s argument is that testimony marks a decisive turning point in our dealings with the objective world that consists in referring sensory experience to something “internal”, rather than exclusively to some specific characteristic of physical objects. The discovery of language amounts to the discovery of one’s *individuality* and his/her crucial *relation* to others: it is the source of the distinction between “facts” – as what is witnessed in the language of others and then possibly confirmed in the subjective direct experience – and “appearances” – as something conflicting with the testimony of others or something idiosyncratic, valid only for one individual. Thus, “error appears, and that can be explained only by supposing a *self* which is fallible” (EPI: 20).

In putting together the emergence of self-consciousness and the awareness of the *fallibility of the self*, Peirce appears to embrace, like Brentano and Husserl, a theoretical perspective according to which consciousness and awareness are always intentional events of the human mind, namely there is no consciousness or awareness that is not concerned with some specific feature and quality of the intended object³. Thus, a phenomenological factor integrates the Humean paradigm of testimony’s *a posteriori* justifications as well as the problematic epistemic quality implied in Hume’s statement that “the *connection* between testimony and reality” is simply a matter of habit, namely that “we are accustomed to find a conformity between them” (Hume 1977: 75). More specifically, like Hume’s so called ‘reductionist’ perspective on testimony, Peirce’s suggestion is that sensorial experience is an important ingredient of the reliability of testimony and, accordingly, the criterion of testimony or intersubjectivity cannot be acknowledged as an absolute epistemic principle. It properly represents both a stimulus to verify individual utterances about the external world and a logical criterion that contributes to create the validity of sensory experiences. With respect to Reid’s *a priori* or ‘anti-reductionist’ pattern of testimony, Peirce’s overall account of logic comes out certainly hospitable of his idea that humans are basically “social creatures” (for instance, EPI: 80–82; EPI: 116). But the Reid’s aprioristic principles of “veracity” and “credulity” – that is, respectively, the ideas that humans have both an *a priori* “propensity to speak the truth” and a “disposition to confide in the veracity of others” (Reid 1983: 94–95) – are reassessed by Peirce as inferentially constructed attitudes. “There is no such thing as having immediate faith in the statements of others ... For whenever

³ See Peirce MS 81: “We have the testimony of consciousness that the subject is not *thought* but *thought of*, that it does not enter into the field of consciousness”.

we believe statements, it is either *because* there is something in the fact itself which makes it credible or *because* we know something of the character of the witness” (W1: 78). Most importantly, “All that we receive upon testimony is hypothesis; it explains the fact that the witnesses agree” (W3: 5).

The cognitive function of testimony is constituted by an intriguing entanglement of the psychological/functional approach to the problem of self-consciousness with the semiotic revision of Kantian transcendentalism provided in *A New List of Categories* (EPI: 1–10), which is implicit in the context we are examining as in every further development in Peirce’s philosophy. Let us just bear in mind that a pivotal aspect of such reconsideration of Kant’s perspective consists in shifting the transcendental notion of “I” as the cause of logical processes to the consideration of the Ego as the *effect* of thought activity or, better, as an *attribute* of actual, concrete embodiment of thoughts in symbolic expressions. On the other hand, without “personal” attributes – such as a voice, a rhythm, a style – a thought could neither communicate nor evoke new interpretants. “Such attributes serve to situate the person, serve as its signature, and little more” (de Tienne 2005: 99).

It is not that Peirce reduces the ego to being a mere locus where thought or the symbolical continuum gets manifested. A person cannot be reduced to a locus of semiotic expression. If there is such a locus, it is that of a living organism. In brief, the “I” is not a mere misapprehension nor can it be reduced exclusively to the communal semiotic movement of thought. Indeed, by emphasizing the role of testimony for the awareness of the fallibility of the self, Peirce does not so much suggest setting the world of subjective consciousness to zero, but searching for the responsiveness of the subject to what is “external” to him/her – (i) the world of intersubjectivity and (ii) that of “objective real facts” (EPI: 52). In particular, although the individual self is not separable from the community of selves, its accordance with others is primarily a *possibility* to be realized (CP 5.402, n.2); moreover, the individual self is a “center of purpose” (Colapietro 1989: 75), an agency of reasoning and this “necessarily involves self-consciousness, self-criticism, and self-control” (ibid.: 105). However, Peirce’s semiotic account of reasoning processes implies the fallibility of knowledge, not only of an individual’s assertions but also of inter-subjectively shared understandings of reality. Thus, testimony or intersubjectivity comes out eventually as an epistemic criterion that cannot be accounted as absolute or definitive but as required and justified by the acknowledgment of the human mind’s constraints: as a fruitful device for coping with the human incapability of grasping the ‘essence’ of both objective and subjective realms by immediate intuition. Most importantly, Peirce’s suggestion of the functional connection of the private self-fallibility and testimony implies that the latter holds a strong psychological power. As testimony is crucial in making out the awareness of what is merely individual or idiosyncratic, it can

also be a very problematic criterion when applied to the so called problem of knowledge of other's mind or to the knowledge of the self: in fact, testimony "will convince a man that he himself is mad" (EPI: 20).

If we do not put aside whatever attention to the concreteness of human beings, it is really hard to detach the tangible psychological influence of testimony on individual mental and practical life from its value on the semiotic-logic level. In any case, the inter-subjective sphere is what Peirce calls into play for rejecting the capacity to distinguish, by immediate intuition, the subjective from the objective elements of cognitions, as well as for challenging the capacity for directly accessing our internal world by introspection (EPI: 21–23). In this latter case, the search for a purely subjective criterion is actually groundless, because none of the "internal facts" are to be ascribed *uniquely* to the consciousness or mental world. For instance, sensations are determined by "the constitution of our mind", and thus entail "something internal"; yet, they are always "predicate of something external" (EPI: 22–23), and it is just because of such a public aspect that they are known or, better, become cognitively relevant. Similarly, emotions – a privileged issue of mentalism or subjectivism – can be acknowledged only by recognizing their predicative side and trying to reflexively identify the particular external object from which they have possibly arisen. This reflexive process corresponds with overcoming the stalemate caused by a purely emotional state – with the overcoming of its typical obstruction of reasoning and acting – and ultimately matches with the distinction between emotions and intellectual judgments (EPI: 23). Indeed, undertaking a process of recognition of the emotional state's possible external reference means transferring oneself to the reasoning activity, which is different in form and content from that of emotion: it means offering reasons for something that initially appears with no reason or reassigning emotions to the space of *explanation*, *control of experience*, and *linguistic interaction*. But all that is, in turn, the space of the semiotic processes implied in linguistic communitarian practices. Therefore, the identification of the object of emotions corresponds to the possibility of communicating or introducing them into an inter-subjective context. This shift can also be considered as a process of rationalization in the negative meaning assigned to the term by psychoanalytic tradition. But the need for rational comprehension of the subjective world is actually a *pragmatic* stance and, in Peirce's perspective, this mostly amounts to a continuous search for factual and inter-subjectively confirmable truths. While this search is to be considered decisive for rational beings and, at the same time, fallible or always *in fieri*, what is certain is the incapability of grasping the 'essence' of the entire realm of the so called internal facts or processes through the logical-semiotic form of representation or as "thirdness": one may only acknowledge their being under the label of the "firstness", namely as a crucial but ineffable mark of thought activity.

The remoteness of the ‘essence’ of feelings and emotions might suggest a noumenal aspect in Peirce’s epistemology apparently in contrast with his rejection of Kant’s doctrine that something can be “absolutely unknowable”⁴. Yet, the inferential approach to the inner world represents nothing but a specific feature of his typical effort to abandon the anxiety of certainty inherent in traditional foundationalism. Peirce concludes his argument about the inner world saying that “the only way of investigating a psychological question is by inference from external world” (EPI: 23). The use of the term “investigate” suggests that we may not so much *define* our internal world by externalist criterion, as *approach* it through a method that promises to be more objective than the non-provable principle of immediate internal intuition. On the other hand, giving up the presumed certainties of immediate introspection does not amount to giving up the first person approach to his/her internal states. To completely deny such a possibility would mean denying the possibility of reactivating the “saying” and “communicating” that a purely emotional state interrupts. The subject would remain isolated in mere individuality, giving up intersubjectivity and the communicative interactions that constitute it: in a nutshell, this would be tantamount to sanctioning the “method of tenacity” for the fixation of beliefs that Peirce clearly discards (EPI: 116).

The Peircean approach to inner world is theoretically similar to Wittgenstein’s perspective as stated in *Philosophical Investigations*: “An ‘inner process’ stands in need of outward criteria” (Wittgenstein 1958, § 580)⁵. Like Peirce, in introducing the notion of “outward criteria” he certainly does not intend to deny that inner facts and processes exist: that sensation, for example, is also a private and subjective fact, or that phenomena such as memory entail a mental process. Rather, his concern is to show how explanations centered on the notion of subjective awareness prove to be inadequate and even misleading. Accordingly, a good part of his reflections on the language of sensations is apparently aimed at putting into focus the epistemic and semantic inadequacy of the introspection principle. The introspective approach will be eventually rejected by him, both as benchmark for the meaning of the terms of sensation and as a fact-finding tool for the “reality” of sensorial experience. Indeed, the linguistic utterances and the psychological processes of sensation form the field for an articulated and complex interpretive approach which will refer to a reconstruction of the naturalistic origins and socio-pragmatic function of this particular linguistic game, of the behavioral attitudes that accompany it, and of the rules that underpin its use and its understanding between individuals. Most importantly, Wittgenstein states that we cannot know what sensations really are since their

⁴ See Stephens (1985).

⁵ See Crombie (1980) about the Peirce-Wittgenstein relationship on the theme in question.

“deep aspect” inevitably escapes our comprehension and “we understand only their language”. In fact, his overall intent is to delineate the conditions under which sensorial experiences or “inner facts” can be asserted, by describing the function, meaning, and correct application of certain linguistic expressions.⁶

On the other hand, the notion of “outward criteria” provides the key for tackling the issue of private language, which is in fact the starting point for Wittgenstein’s analysis of sensation language. This notion extends to the *Remarks on the Philosophy of Psychology*⁷, and constitutes a model of Wittgenstein’s approach to the problems of his later philosophical psychology. In this particular context, the “outward criteria” previously put forward to counter the introspective principle clearly do not replace the latter’s epistemic claims. The dimensions of language and behavior to which these criteria refer represent only the coordinates of inner experiences’ possible expressions, but they do not reproduce their “truth” or “essence”. In a nutshell, they are points of reference to which the recognition between individuals of a certain inner experience is entrusted, but they do not offer cognitive guarantees or univocal possibilities of definition, just as behavior and language never have univocal meanings and functions. In this regard, some pages from Wittgenstein’s *Remarks on the Philosophy of Psychology* prove again the problematic character of “outward criteria”: they are useful for a first, hypothetical approximation of one’s own psychological state and those of others; but are not conclusive for the application of certain mental terms to a subject unless integrated with the testimony of the subject in question⁸.

To sum up, for both Wittgenstein and Peirce the epistemic value of the plea for outward criteria in the analysis of subjective psychological questions is not self-sufficient. In particular, beyond its potential truthfulness and objectivity, testimony of others may involve lack of intelligence of human differences and distinctiveness, mere conventionalism, and finally the risk of inauthenticity. It has a privileged function in allowing individuals to acknowledge the structural fallibility of their idiosyncratic ideas or utterances, but it can also convey mystification and deceit – Heidegger’s “man sagt” – so that, as Peirce remarks, it “can convince a man that he himself is mad”. To be sure, Peirce states that “man is an external sign” (EPI: 54) but this mostly amounts to acknowledging the resemblance of human beings’ complexity and that of any single link of the semiotic chain that constitutes our thinking and communicating capability.

⁶ For the interpretations in verificationist and behaviorist terms of the notion of “outward criteria” see Kripke (1982: 82–91).

⁷ Wittgenstein, Ludwig (1980), *Remarks on the Philosophy of Psychology*. Oxford: Blackwell.

⁸ For a more detailed account of Wittgenstein’s discussion of psychological ascriptions, see Hark (2004).

Robert Lane¹

5 Against Pretend Doubt

Let us not pretend to doubt in philosophy what we do not doubt in our hearts.

(W2: 212, 1868).

This pronouncement is from “Some Consequences of Four Incapacities”, the second of three papers that constitute Peirce’s “cognition series” (*Journal of Speculative Philosophy*, 1868–69). The context of the passage is his criticism of the Cartesian idea that “philosophy must begin with universal doubt” (W2: 211). Here I will consider Peirce’s concepts of belief and doubt and the roles that they play in his criticism of Descartes’ method of doubt.

Peirce used “cognition” as a general term for a class of mental activities or events that includes conceiving, imagining, dreaming, and – most relevantly to the present discussion – believing (W2: 204). Each sort of cognition “is of the nature of a sign” (W3: 76); “whenever we think, we have present to the consciousness some feeling, image, conception, or other representation, which serves as a sign” (W2: 223). But no cognition, and thus no belief, is wholly and completely present in the mind of a thinker at any one instant. Cognitions are not static pictures in the mind but rather “events, acts of the mind” (W2: 225), and thus take time to occur. In this way cognition, and therefore believing, is analogous to motion, which does not occur in a single instant but only across some interval of time.

At no one instant in my state of mind is there cognition . . . but in the relation of my states of mind at different instants there is. . . . Accordingly, just as we say that a body is in motion, and not that motion is in a body we ought to say that we are in thought and not that thoughts are in us. (W2: 227 and n.4).

Peirce echoed this idea in “How to Make Our Ideas Clear”, writing that some elements of consciousness, viz. sensations,

. . . are completely present at every instant so long as they last, while others (like thought) are actions having beginning, middle, and end, and consist in a congruence in the succession of sensations which flow through the mind. They cannot be immediately present to us, but must cover some portion of the past or future. Thought is a thread of melody running through the succession of our sensations. (W3: 262–63; see also W6: 186).

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In the years following the publication of the cognition series, Peirce added a further dimension to his conception of belief: belief always involves a disposition to behave in some specific way given certain circumstances, “some habit which will determine our actions”. (W3: 247) My belief that my car needs gasoline in order to function involves a disposition to behave in particular ways when specific conditions arise, e.g., when I am driving and notice that the fuel-gauge indicates that my car is almost out of gas, to stop at the nearest service station and fill up. The cognitive processes involved in believing are not segregated from our tendencies to act. It would be a mistake, though, to think that Peirce *identified* belief with habits or dispositions to act, since that would be to neglect the representative aspect of belief. He recognized that there are true beliefs and false beliefs – the notion of *true belief*, or belief in “the real”, is essential to his pragmatic theory of truth and reality (see, e.g. W3: 272) – and he held that “in its mere nominal definition” the word “truth” means “the correspondence of a representation to its object”. (EPII: 379)² Habits are neither true nor false, and so Peirce’s view was not that beliefs are nothing but habits. A genuine belief will have both a representative aspect and a behavioral aspect.³

When an individual lacks the belief that p , this is either a matter of sheer “unconscious ignorance”, i.e., the failure of that person “to conceive the proposition [that p] at all” (W3: 21), or it amounts to her having doubts about whether or not it is the case that p . Here it is important to note that by “doubt”, Peirce does not mean a negative belief, such as one expresses when she says “I doubt that Bob will be here on time today; he’s almost always late”. Someone who makes that statement *believes* that Bob will probably be late. Doubt is something else. First, doubt feels different than belief, in that it is “an uneasy and dissatisfied state” while belief “is a calm and satisfactory state” (W3: 247; see

² This suggests that Peirce may have understood a correspondence account of truth as providing a clarification of the concept of *truth* to the second degree of clearness. He definitely took his own pragmatic account of truth to provide a clarification of that concept to the third degree of clearness. On degrees of clearness, see W3: 257–266. For an early statement of his pragmatic theory of truth, see W3: 273. For other passages in which Peirce approves of a correspondence account of truth, see W3:256; CP 6.67; and EPII: 182.

³ Peirce’s concept of belief was influenced by that of Alexander Bain, who held that “[p]reparedness to act upon what we affirm is . . . the sole, the genuine, the unmistakable criterion of belief” (505). In 1907 Peirce wrote that Nicholas St. John Green had “urged the importance of applying Bain’s definition of belief” during meetings of the Metaphysical Club in the early 1870s. (CP 5.12; EPII: 399) Haack (1982: 241f.) describes Peirce’s indebtedness to Bain in this regard. Haack’s own work in epistemology relies crucially on a distinction similar to the one found in Peirce between the dispositional and representational aspects of belief: *s-belief* (belief state), the state of believing a given proposition, and *c-belief* (belief content), the proposition that is believed. See Haack 2009.

also CP 5.510).⁴ Second, doubt has a different kind of effect on our behavior than belief does. To doubt whether *p* is to have in mind the proposition that *p* and yet not have one's behavior determined in a *regular* way by that proposition (W3: 20–21). Instead, it is to be “stimulate[d] to action until [that doubt] is destroyed” and replaced by belief (W3: 247).⁵ Peirce calls this “struggle” to escape doubt and “attain a state of belief” *inquiry*, although he “admit[s] that this is sometimes not a very apt designation” (*ibid.*).

Descartes' method of philosophical inquiry, the so-called “method of doubt”, requires that the inquirer adopt a policy of deliberate doubt about everything, i.e., that he try actually to give up all of his current beliefs and to doubt as much as he can: “The seeker after truth must, once in the course of his life, doubt everything, as far as is possible”.⁶ On Peirce's reading, Descartes claimed early in his *Meditations* to be doubting nearly all of his own beliefs, with only the *cogito* withstanding this skeptical onslaught.⁷ But on Peirce's view, genuine doubt is never within one's direct control: “it is as impossible for a man to create in himself a genuine doubt by such an act of the will as would suffice to imagine the condition of a mathematical theorem, as it would be for him to give himself a genuine surprise by a simple act of the will”. (CP 5.443; EPII: 348) Real doubt “always has an external origin, usually from surprise”, such as when an unexpected observation or other sensory experience causes one to question what one previously held for true (*ibid.*). No purportedly voluntary instance of doubt is the genuine article, and thus Cartesian doubt is mere “paper-doubt”. (CP 5.445; EPII: 349) We cannot transmute our beliefs into doubts at will, and so no one can begin inquiry by doubting all, or nearly all, of his present beliefs. Human inquirers must begin with the beliefs that they already have. (W2: 212; see also CP 8.144; EPII: 62). To adopt Otto Neurath's well-known metaphor, “We are like sailors who must rebuild their ship on the open sea, never able to dismantle it in dry-dock and to reconstruct it there out of the best materials”.⁸ Just as sailors who desire a sturdier ship do not have the option of dismantling their entire vessel while at sea in order to reconstruct it from more trustworthy

4 Again consider the influence of Bain, who wrote: “The real opposite of belief as a state of mind is not disbelief, but *doubt*, uncertainty; . . . the situation called uncertainty, ignorance, hesitation, vacillation, is at all times prone to excite the perturbation of fear”. (509) Paul Thagard has emphasized this aspect of Peirce's concept of doubt and sees doubt as described by Peirce as an example of what he calls *emotional* or *hot cognition*. (2006: 159).

5 See also EPII: 336; CP 5.417.

6 *The Principles of Philosophy*, in Descartes 1988:160.

7 *Meditations on First Philosophy*: 80, and *Discourse on the Method*: 36, both of which are in Descartes 1988.

8 Neurath 1932/33: 201.

stuff, no inquirer can begin by setting aside everything, or nearly everything, that he currently believes in order to start from an epistemically certain foundation.

[T]here is but one state of mind from which you can “set out”, namely, the very state of mind in which you actually find yourself at the time you do “set out” – a state in which you are laden with an immense mass of cognition already formed, of which you cannot divest yourself if you would ... [D]o not make believe; ... recognize, as you must, that there is much that you do not doubt, in the least. (CP 5.416; EPII: 336).

Peirce’s view was not that an inquirer has no control whatsoever over whether he doubts that *p* or believes that *p*. Rather, it is that he cannot make himself doubt that *p* just by saying that he does, or by asking whether or not it is the case that *p*: “the mere putting of a proposition into the interrogative form does not stimulate the mind to any struggle after belief. There must be a real and living doubt, and without this all discussion is idle” (W3: 248). Self-induced doubt is possible, but not as easy as Descartes’ method suggests: someone who wishes genuinely to challenge one of his own beliefs should “invent[] a plan for attaining to doubt, elaborate[] it in detail, and then put[] it into practice, although this may involve a solid month of hard work” (CP 5.451; EPII: 353). Doubts that emerge from such a process may be “the weighty and noble metal itself” rather than a Cartesian “counterfeit []or paper substitute” (*ibid.*).⁹ But in no circumstance will doubt come to replace *all* of one’s beliefs. “[T]here are no such beings as absolute sceptics. ... [T]hough there are inanimate objects without beliefs, there are no intelligent beings in that condition”. (W2: 242)¹⁰

Given the connection between belief and action, Descartes’ behavior might be understood as evidence against his claim that he succeeded in doubting the existence of his own body and of the world that he seemed to be experiencing via his senses. He did not waver when he put pen to paper to record his thoughts, and this shows that he never failed genuinely to believe that the pen, the paper and his hand were all real. It is difficult to imagine the behavior of someone who *does* genuinely doubt the existence of his own body, of the chair that he seems to feel beneath him, and of the fire that he seems to see before him. Descartes had a response to this sort of charge: the doubt required by his method should not be allowed to affect “ordinary life” but “should be kept in check and employed solely in connection with the contemplation of the truth”.¹¹ Peirce’s criticism of this move was withering:

⁹ It is a constituent claim of Peirce’s *critical common-sensism* that this sort of doubt, “the weighty and noble” sort eventuating from deliberate, painstakingly planned challenges to one’s own beliefs, is valuable to philosophical inquiry. (CP 5.451; EPII: 353).

¹⁰ In 1893, Peirce changed this to: “. . . there may be no intelligent beings in that condition”.

¹¹ *Principles of Philosophy*, in Descartes 1988: 160.

[A]s if it were possible for a man for days to keep up, without fail, a line of conduct about all things without the slightest belief in the advantage of such conduct – always, for example, using the tongs to stir his fire, instead of his fingers, though he had utterly dismissed all belief that fire would burn his fingers.¹²

Peirce might also have replied that the possibility of quarantining a philosophical doubt from one's ordinary life just goes to underscore the artificiality of that doubt. No genuine doubt could be restricted only to the activities that one performs *qua* inquirer, because any genuine doubt, especially doubt about such an important matter as whether one's own body exists, must have more general effects on one's actions.

Some commentators have faulted Peirce for mischaracterizing the role of doubt in Descartes' method. According to Robert Meyers, Peirce "misrepresents Descartes rather seriously ... Descartes does have reason to doubt what he doubts".¹³ Similarly, Susan Haack argues "that there is evidence that Descartes' method is relevantly different from what Peirce takes it to be, and that it does not require ... that one voluntarily set out to doubt what one initially believes".¹⁴ Lesley Friedman defends Peirce's reading of Descartes, arguing that "Peirce's criticism(s) does not rest on a misunderstanding ... rather ... there are at least two different procedures involved in Descartes's method, and Peirce noticed and objected to one particularly: namely, the effort to question moral certainties that are metaphysically uncertain".¹⁵

¹² Peirce 1906: 242.

¹³ Meyers 1967: 13. The main problem Meyers identifies with Descartes' method is not its use of doubt but its assumption that indubitability is a necessary condition of knowledge.

¹⁴ Haack 1982: 244. Haack also argues that Peirce's complaint that the method of doubt is impossible was not his fundamental objection against Descartes. On her view, Peirce's fundamental objection was that that method is *pointless*; even if we could put it into practice, its goal – epistemic certainty – is something that, according to Peirce, we can never attain.

¹⁵ Friedman 1999: 724–725.

Ivan Mladenov¹

6 Motion and Thought – a Generic Metaphor

Accordingly, just as we say that a body is in motion, and not that motion is in a body we ought to say that we are in thought and not that thoughts are in us. (CP 5.289 fn., 1868).

This footnote, hardly two-lines long, which appeared in the “Four Incapacities Claimed for Men” can be easily attributed to Peirce’s reading of Berkeley or dismissed as insignificant. It is a footnote marked solely by an asterisk. Linguistically, it is a simple comparison, framed by two big elements bound by the conjunction “just as”.² In fact, it is a variant of a frequent and powerful metaphor which can be traced back to Plato and Aristotle.

However, it did not emerge in Peirce’s review-article “Frazer’s *The Works of George Berkeley*” (1871) but in the earlier essay “Some Consequences of Four Incapacities” from 1868. The text generating the footnote supposedly clarifies the nominalism of Berkeley. Peirce’s concern with the nominalists is important for a number of issues in the interpretation of his own thought, but the focus of the present article is not on the arguments he debated. We will concentrate on the metaphor itself, its immediate contexts, and the consistency wherein its three elements appear: body, mind, and motion. Do they bear more than just a higher expressiveness? Do they indicate something constant that must be “imprinted” in the reader’s consciousness, or is Peirce embedding a new meaning in an old metaphor? If the latter, does he achieve new results?

The immediate reference to the footnote is this: “At no one instant in my state of mind is there cognition or representation, but in the relation of my states of mind at different instants there is” (CP 5.290). Cognition arises only if it includes *relation* that is *generality*, this is what Peirce establishes. The real generality correlates the instances of mind in any act of knowledge. It embraces them into wholeness (thought) that closes the cognition act. In the passage that precedes the one discussed here, Peirce clarifies the three functions of thought: representational, relational, and qualitative. A shared characteristic is their existence. During his lifetime his view about the three elements in the act of cognition did not change. He gradually conceded reality to Thirdness, then to the

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² In the present article I will refer to it as a footnote and as a metaphor.

Secondness, and finally to Qualia (Firstness). Yet, only Secondness is said to necessarily *exist*.

Peirce sees the inadequacy in the treatment of the real and existing as the key nominalistic problem, where the distinction between the representation in mind and the reality of the external objects has not been resolved. In the text under discussion he stresses the real nexus that brings one thought into relation with another (CP 5.290). But what does the footnote stand for? It oddly refers to thought as unknown wholeness or as universe for itself. The metaphor is surprisingly vague and points to the meticulous explanation in the text, but also carries reminiscences of the Berkeleyan “thinking minds”, “souls”, or “spirits”. Was it at all meant to contribute to a clarification? Or, was this loose comparison merely dispersing and dissolving the details of the text into much broader associations from the footnote? And what were these?

Following Peirce, we will proceed to draw a hypothetical conclusion: although Peirce might have had Berkeley’s nominalism on his mind in this footnote, he embedded in it an entirely new concept of thinking as a triadic process. By rearranging its well-known components, Peirce empowered the metaphor’s enormous potentiality to summarize and abstract the thought relation. The metaphor was employed in both a traditional and innovative way: as a common speech figure, and as a tool for modifying a new concept. In the sentence under discussion, Peirce elucidates the connectedness of instances of mind as the only condition wherein knowledge occurs – but he also goes a step further, introducing continuity as a necessary condition for the same process. Generality must embrace the tri-lateral unity of thought. Only then does the act of knowledge take place and start to flow as a continuous process. The explanation supports the last of the four big denials stated in the beginning of the essay: that we have no conception of the absolute incognizable. It was famously rejected by claiming that no actual thought unmediated by another thought can have any meaning without being represented by subsequent thoughts. When representation is mediated by an effective force “behind consciousness”, knowledge begins to flow in a continuous stream. But what is this force and how does it act? We may only guess that it might be the Aristotelian innate pursuit of knowledge; some bioelectrical stimuli, produced by the “circuit” of all participants wired in the chain; or the force runs as a molecular model, where the movement springs up from the difference of gravities and distances of the elements. However, it might be, the rule is that all components must work simultaneously. They need not only to be present, but an inward vibration must link them together to ensure a permanent run.

Are there other passages in the essay where analogous figures appear? No need to go further than to the previous sentence to find such: “But this is a

fallacy similar to saying that, if in no one of the successive spaces which a body fills there is room for motion, there is no room for motion throughout the whole” (CP 5.289). Again, the same three components – the body, the movement, and the motion combined to visualize the continuity, which is the “upper” layer of thinking. And a bit further: “There is some reason to think that, corresponding to every feeling within us, some motion takes place in our bodies” (CP 5.293). The contextual surrounding similarly emphasizes continuity as the condition for a cognition process to begin.

This essay contains a number of issues upon which Peirce worked through his lifetime: on the thought-sign and man as a sign; on thinking as a train of signs; on continuity and the tri-relational nature of thought processes; on the quality of sign and the representational function of thought; on words that are not that different than humans; on the hypothesis, etc. Although the topics here are in an embryonic stage, they clearly show all the characteristics of their later versions. Peirce groups them together in triads similar to the one of the footnote metaphor. The metaphor enables him to enhance their expressiveness to extremes. The entire list above is a good example: the relationship between thinking and sign becomes “thought-sign”, “man as sign”, “train of signs”, and later, “semiosis”. The notion of continuity developed toward the synechistic doctrine from his cosmology, and one of the hypotheses evolved to the concept of abduction.

Does Peirce consistently use equivalent figures in the review-article on Berkeley’s translation by Alexander Fraser? Why did we say at the beginning that the footnote is, at first sight, attributable to Berkeley? In this essay, Peirce argues with the nominalist “cliff” between external and existing, which stops Berkeley’s realism from advancing beyond the realisms of Ockam and Scotus. According to Peirce, this comes from the inability of Berkeley to admit realness to generality. If generality is not real, then existence is attributable to singular objects only. General types or laws as mental constructions are excluded, so they do not have real existence. On this occasion, Peirce proceeds to make his distinction of what is real and what is existent in order to surpass Berkeley’s collapse of the former into the latter. In fact, Berkeley made some concession to his own claim by saying that he opposes the existence of Locke’s *abstract* general ideas only. He allows that abstract ideas can be mere signs of particulars and even that a sign can stand for more than one particular idea. Yet, he still rejects any possible connectedness between ideas. For him, ideas are inert and “visibly inactive” (Berkeley Sec. 25: 160). Therefore, the connection between them does not imply the relation of cause and effect, but is only a mark or a sign, which the objects signify. For this reason he made his turn to the sign notion and to the combination of effects and action, which becomes knowable

if this combination is made by rule and with “wise contrivance” (Berkeley Sec. 66: 177). The “wise contrivance” cannot be found in the external objects, though, but in the “free spirits” again.

Berkeley employs the three elements: body, motion, and mind (rarely thought) throughout his treatise³ and even more frequently in the dialogue between Hylas and Philonous. There is barely a page without him bringing the elements together to illustrate his chief argument that they exist in the mind only. He asks, for example: “Is it not as reasonable to say that motion is not without the mind since if the succession of ideas in the mind become swifter, the motion . . . shall appear slower without any alteration in any external object?” (Berkeley Sec. 14: 156). Then he goes even further by doubting that it can be claimed that a body is in motion at all, moved by any force. He argues that we would rather see it changing its distance, though we do not see any force applied to it: “As a man may think of somewhat which does not think, so a body may be moved to or from another body which is not therefore itself in motion” (Berkeley Sec. 113, 196). The examples with the triple relation figure pile up to strengthen his famous rejection of the existence of matter out of mind. His metaphor is finally embraced and shaped by a higher mind. The material thing (a body) in its only existence as idea will last as long as some mind perceives it. However, its permanent existence is secured in the mind of God. Bodies and movement exist within a thought, a giant pre-thought, His thought.

But this is not the entire truth, and Peirce argues with such oversimplification of Berkeley’s view on the material thing, usually summarized as follows: “Should every mind cease to think it for a while, it ceases to exist”. As he remarks, for Berkeley the thing obtains its existence in the mind, but it is not dependent on the thought about it, being composed as a thought through its correlation with experience in general. The reality of sensible things resides in God’s mind as forms of archetypes. For Peirce this is only a platonistic attempt to avoid the problem where knowing the divine mind also requires generality in terms of analogy, relation, or symbol.

Whatever arguments Peirce brings out against Berkeley’s nominalistic platonism, idealism, and Scotistic realism, he is crediting him for his individualistic pragmatist view and for his semiotic insightfulness. And he continues to explore the same metaphor from the footnote for different purposes. Its configuration varies, but the elements remain the same: body, motion, and thought. As we said, the two big parts of the footnote joined with “just as” are clearly a comparison. Yet, with only an adverbial and a conjunction (“in thought”), Peirce created a captivating metaphorical expression – we are inside of thought. Did

3 A Treatise Concerning the Principles of Human Knowledge, 1710.

he imply that thoughts are lightning-fast flashes shed over massifs of comparisons, relations, and correlation stored in the brain and arriving at conclusions that otherwise seemed to be reached after a long process of reflection? We have good reasons to assume so, while just reading the following:

The abductive suggestion comes to us like a flash. It is an act of insight, although of extremely fallible insight. It is true that the different elements of the hypothesis were in our minds before; but it is the idea of putting together what we had never before dreamed of putting together which flashes the new suggestion before our contemplation. (CP 5.181).

Although this is from his later writings on pragmatism, the components and the meaning of the metaphor remained unchanged. This is even clearer from the way Peirce mastered the abductive syllogism emulating the way he used to combine the three elements in the analyzed metaphor. He inserts one of the components of the syllogism (“we”) into a quite unusual place: as a conclusion, rather than as a premise, so that it strikes the routine perception: “we are in thought”. Thus, instead of being placed under God’s ultimate “archness”, thought becomes a vibrant and active part of the wholeness of the metaphor. Thought is now not finishing the metaphor’s entirety, but flashes with the inward force of the triad. It grows wings to catapult the new meaning in it.

Where are those ratiocinations coming from? In the footnote Peirce pictured the thought in a similar fashion to Berkeley and gave no implication for any activity in it. We are inside thought, is what is being said, and the expression finishes. We can imagine that while being “in thought”, the only thing we can do in order to produce another thought is to somehow “scratch” it out from the divine one. We can say so if we were under a strong Berkeleyan influence. Berkeley’s loci: “within”; “framed”; “shaped” (always by Him); have literally encircled and sealed the elements of the metaphor. In other words, its “upper layer” is where the process ends, closed under an unknown “lid”. This is why the other two elements remain passive, regardless of the fact that one of them is “motion”. There is no inner power to move them. Their qualities are determined by His reason.

However, in Peirce’s reasoning, for a thought to be perceived it must first, be related to subsequent thoughts and second, run in a continuous process. This is a moving, circulating, dynamic thought. As Douglas R. Anderson and Peter S. Groff noted (again in a footnote):

Peirce’s realism also tries to outflank the question of externality by understanding our ideas to be dimensions of a community of thought. Peirce often tried to get at this by stating that we are in thought; thought is not in us. (1998: 170).

And here is Peirce's view from the side of reality: "Thus, the very origin of the conception of reality shows that this conception essentially involves the notion of a COMMUNITY, without definite limits, and capable of a definite increase of knowledge" (CP 5.311). The notion of a community means "within the community of thought" – in other words, inside a manifold of thoughts. This is pretty similar to the way Peirce created another illustrious metaphor – on ideas in consciousness moving upward as if from a bottomless lake, where one idea is catching another so they move up toward a more vivid stage of knowledge. And here is the same view of him from the point of existence: "In this way, the existence of thought now depends on what is to be hereafter; so that it has only a potential existence, dependent on the future thought of the community" (CP 5.316). Thus, "we in thought" is not the Berkeleyan thought, unmovable and passive; it is a diverse, community determined, vivid thought that secures the unlimited growth of knowledge. For the sake of justice, we can remark here that Berkeley's frequent attempts to exchange "thought", "mind", and "free spirits" in the metaphor conceivably show his struggle to make it more dynamic. In other words, Berkeley was not thoroughly "Berkeleyan".

We can speculate on whether Peirce was indeed trying not to continuously use the same metaphorical "shell", inserting in it new elements: sign (instead of body); material character of it (motion); and relation (thought). Cause-action is not excluded. The elements change places but the conditions of relation and continuity remain. We can also apply a similar analysis of the same metaphor to Hume and Locke's work and not be greatly surprised to see that these authors have frequently employed it. But it will be another topic of a broader context. It is tempting though to find the same figurative ensemble in an unexpected thinking model, for example, in Wittgenstein:

I do not explicitly learn the propositions that stand fast for me. I can discover them subsequently like the axis around which a body rotates. This axis is not fixed in the sense that anything holds it fast, but the movement around it determines its immobility. (Wittgenstein, 1969–1975: 152).

It does not seem that he contributed new meaning to the old metaphor in this rather "engineered" construction. But did we not say the same about Peirce? We would be advised to stop here and reaffirm our rule-conclusion, based on accumulated cases: the old and very powerful metaphor we discussed here can elevate thought to the unforeseen heights of human reason. It is capable of preserving and carrying on meaning in an embryonic stage to be revealed for a new interpretation. Peirce mastered it to signify with all three parts it possesses – as a fascinating composition for ideas to be developed by future minds. A truly generic metaphor.

Sami Pihlström¹

7 Peirce on Realism and Nominalism: the Metaphysics and Ethics of a Community of Inquirers

But though the question of realism and nominalism has its roots in the technicalities of logic, its branches reach about our life. The question whether the genus homo has any existence except as individuals, is the question of whether there is anything of any more dignity, worth, and importance than individual happiness, individual aspirations, and individual life. Whether men really have anything in common, so that the community is to be considered as an end in itself, and if so, what the relative value of the two factors is, is the most fundamental practical question in regard to every public institution the constitution of which we have it in our power to influence. (W2: 487, EPI: 105, 1871).

It is impossible to summarize Peirce's complex doctrines, such as his "extreme scholastic realism" about what he called "real generals", in any easy and simple way, but the above quotation from the last paragraph of Peirce's review of A.C. Fraser's *The Works of George Berkeley* (first published in *North American Review*, October 1871; available in CP 8.7–38, W2: 462–487, and EPI: chapter 5) provides a key to what I find distinctive about this form of realism. The quote leads us directly into Peirce's peculiar integration of *ethical* and *metaphysical* perspectives on the issue of realism. While the debate on realism vs. nominalism has traditionally – at least since Plato's and Aristotle's influential theories – been understood as the question concerning the mind-independent reality of universals or Forms and may therefore seem to be a purely metaphysical debate, it is, Peirce shows us, in fact a fundamentally ethical issue as well. The way we think of the metaphysical status of such "generals" as laws, habits, dispositions, possibilities, and so forth, is not merely a matter of abstract metaphysical concern but has absolutely crucial consequences for our lives as human beings, including our ethical as well as scientific lives.²

In brief, the reason why the all too often neglected ethical dimension of the realism vs. nominalism debate is worth emphasizing is that any philosophical issue concerning human cognition and the cognizable world (that is, any issue of epistemology and metaphysics) is ultimately linked with our communal

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² For a more thoroughgoing explication of Peirce's doctrine of real generals, emphasizing its ethical aspects and citing relevant commentators such as Susan Haack and Carl Hausman, see, e.g., Pihlström 2009, chapter 6; and 2012.

nature as human beings: as cognizers of and inquirers into the world around us, we inevitably rely on other human beings in a joint effort of communicative inquiry and semiosis. Our “individual happiness, individual aspirations, and individual life” cannot therefore be the primary motivations for our engagements in any inquiries, be they scientific or philosophical – or ethical.

As I have tried to argue on other occasions (cf. Pihlström 2009, 2013), metaphysics and ethics are deeply integrated in pragmatism generally – including special fields of pragmatism, such as pragmatist philosophy of religion. In particular, this is, in my view, true about Peirce’s metaphysics of “real possibility” (his pragmatic modal realism, as we may call it), which, I suggest, is inextricably entangled with a certain kind of pragmatic *moral* realism (Pihlström 2012). Here I will only have a chance to briefly comment on the fundamental importance of the notion of *community* for these issues as well as Peirce’s somewhat debatable role as the “first pragmatist”. The latter needs to be revisited in light of the 1871 quotation.

Pragmatism: the entanglement of metaphysics and ethics

Peirce is often referred to as the founder of pragmatism. (On Peirce’s place in the tradition of pragmatism, see, e.g. Pihlström 2004). I find it important to note that this role of his is not restricted to his famous writings about the pragmatic method in such essays as “The Fixation of Belief” (1877) and “How to Make Our Ideas Clear” (1878) (both available in EPI and W3). Already well before the explicit emergence of pragmatism in the “Metaphysical Club” meetings in the early 1870s, Peirce had formulated a version of his scholastic realism, and as the quotation from the 1871 Berkeley review shows, he maintained at that early stage that the issue of realism vs. nominalism – that is, the problem concerning the reality of generals – is, while rooted in “technicalities of logic”, nevertheless “the most fundamental practical question” we should consider when developing our public institutions.

This is an astonishing statement. By no means, then, was Peirce’s pragmatism as a philosophical position or approach confined to “technicalities of logic”, although some later pragmatists – including Richard Rorty (1982), in particular – have notoriously perceived his contribution to the pragmatist tradition to lie primarily in the fact that he gave it a name. Whether human beings have something “in common” and whether and how a true community – an ethical community, or a rational community of inquirers – is so much as possible

is a philosophical question we cannot ignore, if we set out to defend and develop any kind of pragmatism whatsoever. A process of cognition is also, inevitably, a process of communication. The realism vs. nominalism issue is only one of the many philosophical problems whose roots are logical but whose “branches reach about our life”. Only rarely, however, have those pragmatists who insist on the relevance of philosophy to life – such as Rorty, for instance – taken Peirce seriously. This unfortunate situation needs to be corrected; Peirce scholarship and pragmatism scholarship more widely are responsible for setting the record straight in this regard.

Biographically, we may note that the 1871 statement about realism and nominalism was written by Peirce a couple of years after he had famously moved from his initial nominalism to a more realistic position. This move is usually dated around 1868, when Peirce noted in “Some Consequences of Four Incapacities” that “the very origin of the conception of reality shows that this conception essentially involves the notion of a COMMUNITY, without definite limits, and capable of an indefinite increase of knowledge” (W2: 239). In fact, these two quotations – the one from the 1868 essay and the 1871 quote above – are chosen by Max Fisch (1984: xxviii) as two “key sentences” of Peirce’s texts in 1867–1871 collected in Volume 2 of *Writings of Charles S. Peirce*. Fisch also speculates about the possible influence of Peirce’s wife Zina on this “community emphasis” (Fisch: xxviii–xxix).

Pragmatism, we may learn from Peirce (even though he does not explicitly mention pragmatism in the 1871 essay from which I am quoting, as the word “pragmatism”, as we know, was first used in print by William James only in 1898), is not merely a matter of applying to various concepts, conceptions, and theories a principle called the pragmatic method. Pragmatism is, much more broadly, a philosophical approach emphasizing the need to examine the potential practical relevance of even the most abstract “technicalities of logic”. As soon as we understand this vital promise of pragmatism, we may also observe that pragmatism almost naturally and unavoidably leads to a profound entanglement of “theoretical philosophy” and “practical philosophy” – that is, for instance, metaphysics, epistemology, and ethics. We may also say that pragmatism in this sense highlights the communal and communicative, hence ethically significant, aspects of any acts and processes of cognition, however theoretical. What is more, pragmatism itself needs scholastic realism, insofar as it is interested in the *potential* practical relevance of our ideas.

It was William James, especially in his *Pragmatism* (1907), a book whose third chapter offers examples of metaphysical disputes pragmatically examined and understood, who developed a version of pragmatism in which the ethics – metaphysics entanglement (as we may call it, possibly viewing it as a precursor

of Hilary Putnam's (2002) fact – value entanglement) plays an explicit and central role. For James, pragmatism is a method of tracing out the (again potential, conceivable) ethical consequences of even the most theoretical metaphysical issues and disputes, such as the one between determinism and indeterminism or the one between materialism (atheism) and theism. However, already Peirce – and already in 1871, that is, long before the emergence of pragmatism as a philosophical school – saw clearly that metaphysical (and “logical”) questions such as the one concerning realism and nominalism emerge in a context of practically – humanly – relevant ethical and social issues and may even influence our ways of developing “public institutions”. Moreover, Peirce's realism is needed, at least in some form, even for the Jamesian pragmatist approach examining the pragmatic core meaning of metaphysical disputes in terms of their potential ethical consequences, because insofar as those consequences remain potential and may never be actualized, we need to have a sufficiently rich theory of “real possibilities” at our disposal.

As I have suggested elsewhere (Pihlström 2013, chapter 5), Peircean extreme scholastic realism has even much wider applications to issues of ultimate ethical and religious significance. For instance, the Kantian doctrine of “radical evil”, emphasizing our general *tendency* (*Hang*) to prioritize maxims that contradict the requirements of the moral law, needs something like a Peircean conception of real generals, because arguably we may be radically evil in the Kantian sense even if we never *in fact* act against the moral law (the categorical imperative). Such potentially far-reaching practical consequences of Peircean pragmatic realism still remain insufficiently explored. Peirce was hardly a theorist of evil, but his realism about real generals could be employed in an attempt to argue that evil itself is by its nature something general, irreducible to its particular instantiations. Such arguments would be helpful in demonstrating that we should postulate any “entity-like” particularity in evil but rather see evil as a generality that is potentially present anywhere in the human world.

A community of inquirers

As is well known, the idea that scientific inquiry is a communal enterprise is of utmost importance in Peirce's philosophy of science. Truth itself was famously characterized by Peirce as the “final opinion” of a community of rational inquirers who employ the “scientific method” (as spelled out in “The Fixation of Belief” and elsewhere), and reality is, according to Peirce, to be understood as the object of such an indefinitely long communal process of arriving at the final opinion.

However, insofar as the entanglement of ethics and metaphysics generally as well as the instances of this entanglement in special cases such as the issue of real generals are taken seriously, we should understand the relevant notion of a community at work here not simply as a community of rational inquirers (that is, something close to what we call the “scientific community”) but more broadly as a community of ethical inquirers (that is, something we might call an “ethical community” potentially including all human beings). Even truth in ethics could, then, be seen as the imagined final opinion of an indefinitely long process of inquiry engaged in by such a community. There is no reason why the scientific method could not be employed in ethical inquiry into moral values and the good life – no reason, that is, why ethics could not be a form of inquiry with as good chances of leading us to cognize “the real” as scientific inquiry.³ In particular, we need genuine ethical inquiry in order to determine, for instance, whether “the community is to be considered as an end in itself”, as Peirce puts it in the quote we are considering.

These suggestions come close to the idea that Peircean modal realism – that is, realism about “real possibilities”, which is part and parcel of his extreme scholastic realism – and what might be labeled Peircean moral realism are as deeply entangled as ethics and metaphysics, or practical and theoretical philosophy are. The notion of community is the heart of this matter. It needs to be invoked whenever we consider such an apparently purely ontological issue as, say, personal identity. Our identities (in particular, our identities as inquirers of any kind) are inevitably *relational*; it is only in our communal relations to other inquirers (cognizers) that we can be inquirers at all. This should be an obvious starting point for any pragmatist metaphysics of identity, social structures, communication, or culture.

Peirce pointed out, we may recall, that the view according to which “I am altogether myself, and not at all you”, is based on a “metaphysics of wickedness” (EPII: 2). Accordingly, the rejection of nominalism is of utmost practical and moral significance. The attack on nominalism (and in favor of “real generals”) is ultimately an attack on individualist egoism and what Peirce called the “Gospel of Greed” (EPI: 357). Regarding our relational identities, Peirce noted that the person “is not absolutely an individual”; instead, “a man’s circle of society” is itself a “loosely compacted person” (EPII: 338). Arguably, all these formulations – significantly later than the quotation we started out from, virtually spanning over Peirce’s entire intellectual career – have their seeds in the 1871 statement about the realism vs. nominalism issue being a “most fundamental practical

³ For leading Peirce scholars’ illuminating reflections on Peircean approaches to ethics and moral realism, see, e.g. Misak 2004a and Mayorga 2012.

question” for us. It is a question that needs to be addressed if we want to understand what we, as human beings, are.

In the years and decades after the 1871 Berkeley review remarks on realism and nominalism, Peirce continued to develop his scholastic realism – also using the label, “extreme” (CP 5.77n1; CP 5.470) – as well as closely related views, such as synechism, the doctrine of continuity (cf. again Pihlström 2009, chapter 6). His continuously rearticulated account of “real generals” and his reflections on the relation between this realist position and pragmatism (or what he in 1905 decided to rename “pragmaticism”) are too complicated to be examined here. It seems to me, in any event, that there are good reasons to believe that he never dropped the ethical component of the scholastically realist position he had formulated already in 1871. The development of Peirce’s realism is itself a story about the entanglement of ethics and metaphysics in pragmatism.

This, I believe, is so even if we keep in mind that science, in Peirce’s view, has nothing to do with what Peirce called “vital matters”. That statement must be placed in its context, the Cambridge Conferences Lectures Peirce delivered in 1898 (see EPII: chapter 4; cf., e.g. Misak 2004a). Peirce did not like James’s suggestion that he should speak about “matters of vital importance” instead of technical logico-mathematical ideas. This is compatible with a philosophical issue, such as the realism vs. nominalism dispute, having its roots in logic while having vital human consequences – as we have seen. As Rosa Mayorga (2012) explains, the vital affairs Peirce did not find scientifically or philosophically relevant are particular matters; in this way, this issue is again linked to scholastic realism. As inquirers, we should be primarily interested in generalities. The ways in which the postulation of real generals may influence our inquiries into, say, public institutions are themselves general, and so is the ethical significance of Peircean realism about generality itself. We should not expect this significance to be immediately manifested in any concrete case of ethical problem-solving.

Yvan Beaulieu¹

8 Peircean Inquiry and Secret Communication

With the doubt (...) the struggle begins, and with the cessation of doubt it ends. Hence, the sole object of inquiry is the settlement of opinion. We may fancy that this is not enough for us, and that we seek, not merely an opinion, but a true opinion. But put this fancy to the test, and it proves groundless; for as soon as a firm belief is reached we are entirely satisfied, whether the belief be true or false. (CP 5.375, 1877; see also EPI: 114–115).

Introduction

Cryptology – the science of all types of secret communications – is an appealing subject for a theory of sign: it is the study of an atypical type of communications that seems to curtail communication. As for cryptological analysis – the branch of cryptology that studies the uncovering of secret messages – it is a process that tries to uncover hidden meaning and bring it back into public communication, an endeavour that is a perfect illustration of what Peirce means with his general concept of inquiry.

The goal of this paper is to show that, between cognitive relativism – where all interpretations are of equal value – and an essentialist approach to semiotics² – where signs have one intrinsic pre-coded interpretation – Peirce proposes a third possibility that, because of his deep understanding of the limits of inquiry, is a better representation of reality.

The first section will give a short description of the field of cryptology, a necessary step since previous literature on the theory of sign shows a deep misunderstanding of this field of knowledge. The second section will introduce the peircean concept of inquiry and its relation to cryptological analysis.

Inquiry and cryptological analysis

Most of the literature on the semiotics of secret communication presents already resolved situations where the secret is introduced along with its solution (see

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² In this paper the term ‘semiotic’ is used to refer to the general science of sign in all its multiple variations, including Peirce’s approach.

Greimas, 1970: 285–307; House and Juhel, 1974; Urbain 1991, 1992; Danesi, 2002) and the method used to find the solution is never taken into consideration. Eco’s discussion (Eco, 1976: section 2.15) – while presenting an in-depth study of the semiotic of secret communication – uses the same approach: it first associates undecoded messages with “pure noise” (ibid.) – since no meaningful code can be associated to them – and then discusses so-called “ciphers” and “cloaks”, presenting them as already solved secret communications (ibid., 2.14.1 to 2.14.4). Tadiotto (2004) is an exception because it explicitly mentions cryptanalysis, but it doesn’t provide a general view of the processes involved and relies heavily on Eco’s conceptions of ciphers and cloaks (op. cit.)³.

While this way of introducing cryptology has its pedagogical advantages, it implicitly or explicitly reinforces the myth that uncovering secret messages is a simple problem, that the solution is already given and pre-coded in the semiotic process. That is not the case in real life.

Actually, cryptology is divided into 2 branches: 1) Production and 2) Analysis⁴. In the Production branch of cryptology, ‘cleartexts’ – the original messages – are transformed into ‘cryptograms’ – coded or encrypted messages – or into ‘steganograms’ – hidden messages – as shown with methods 1, 2 and 3 in

Figure 1 below⁵.

Method	Cleartext	Result
1) Coding	THE CAT ON THE MAT	uif dbu po uif nbu
2) Encrypting	THE CAT ON THE MAT	ujhdhg aqqdynlaodx
3) Hiding	CAT	calvin ate tomatoes

Figure 1: Examples of cryptological methods⁶

³ Beaulieu (2005), section 3.1, presents an exhaustive survey and critical analysis of the literature on the semiotics of cryptology. Tadiotto (op. cit.) is not included in that survey as it was not available at the thesis’ editing time.

⁴ The following paragraphs present a high-level description of cryptology. For those interested in the general history of cryptology, David Kahn is *the* reference on the subject (Kahn, 1967). Moore and Waller (1962), Weber (1993) and especially Singh (1999) are also recommended. For the French reader, Muller (1971) is a good reference. Section 1.1 of Beaulieu (2005) presents an in-depth description of cryptology from a non-technical perspective.

⁵ Compression is another method that would have to be included in the domain of secret communication for reasons that are explained in Beaulieu (2005), mainly in section 2.8. The present paper will not dwell further on the subject, as it is not critical to its goal.

⁶ The examples of Figure 1 are given mainly to illustrate the general characteristics of each method and do not intend to cover the vast number of variants of each method or their technical inner workings.

Hiding (method 3) also includes techniques like inserting secret messages in paintings, drawings, computer files, embedding messages in different objects such as shoe heels or hemlines of clothes, writing with invisible ink, etc. Steganography – the general science of hiding messages, a branch of cryptology – treats of all these techniques. Furthermore, all cryptographical methods can be applied to one another recursively: for example, the result of hiding can be encrypted or the result of encrypting can be hidden.

In the Analysis branch of cryptology, the goal is recovery of the original cleartext without prior knowledge of the secret involved. Analysis can be further divided into cryptanalysis – methods of uncovering secret messages from cryptograms – and steganalysis – methods of uncovering secret messages from steganograms. The secret aspect of the communication relies on the hope that finding the cleartext is not an automatic process for the Analyst: it should be harder for the Analyst than for the people privy to the secret transformation.

To prevent the misunderstandings shown by the previous literature on the semiotics of cryptology, it is important to present a hypothetical ‘real-life’ situation. Let the reader suppose that he is hired as a cryptological analyst: this involves the following steps:

- 1 select the communications to be analysed, i.e. those that are susceptible to contain a secret;
- 2 identify them as either cryptological or steganographical;
- 3 apply the proper analysis method: cryptanalysis or steganalysis;
- 4a if possible, confirm the diagnosis by uncovering the secret message;
- 4b if the solution seems to contain yet another secret message, go back to step 2 above.

The following characteristics of cryptological analysis show that the myth of ‘easy-to-find-solutions’ is not realistic:

Step 1 is prone to false-positives and false-negatives: faced with each communication we might be mistaken in thinking there *is* or that there *is not* a secret message present;

in particular, noisy transmissions might appear as encrypted messages and innocuous messages might actually hide steganographic transformations (see the ‘result’ column of Figure 1 above), thus foiling steps 2, 3 and 4a (improper identification, useless application of the related method, improper result or no result at all);

step 4b is necessary because of the recursive aspect of cryptological transformations : the result of the previous steps has to be treated as a communication itself, hence it is susceptible to cryptological analysis, along with its susceptibility to error.

With these basic principles in mind, we can now discuss peircean inquiry – and Peirce’s quote – in the light of cryptology.

Peircean Inquiry

Peirce became interested in the process of inquiry at an early age: he studied chemistry (Brent 1998: ix; W1: xvii–xviii) and less than two years after getting his degree in 1863 – at the age of 24 – he gave a Harvard lecture on ‘The Logic of science’ (W1: 162–302), showing an interest in the inner workings of science, « Peirce’s ruling passion » (Short 2007: 287). The quote at the head of this paper comes from the first of a series of six articles entitled ‘Illustrations of the Logic of science’ (EPI, chapter 7 to 12), all published in 1877–78. Peirce started writing the first article of the series, ‘The Fixation of Belief’, at the end of 1875 while staying in Paris on an appointment by the U.S. Coast and Geodetic survey (Brent 1998: 99). He continued working on the article at the end of 1877, while returning to America (ibid.: 115–116).

According to Brent, “... Peirce put that method [of science] in its modern form in such an elegant fit that the ‘Illustrations’, though revolutionary, appear to us now merely the common-sense of it”. (ibid.: 117; see also Short 2007: 317 & 326). In fact Peirce’s quote itself (CP 5.375, at the head of this paper) might appear common-sensical at first glance but it goes against a semiotic trend that would have us believe that signs are pre-coded and that a true opinion is easily reached (see in particular Eco 1984: 5.5.1). Some signs might be pre-coded but – in the context of secret communications – only the sender of the transmission knows the actual code: by definition the Analyst is not privy to that information. What previous commentators on the semiotics of cryptology have failed to see is that cryptological analysis is not a timeless event, a God’s eye view where the essence of things is known beforehand. In cryptology as in many other domains, truth is reached through a process that involves time and a community of truth-seekers. This is a central peircean concept, mentioned on numerous occasions (see in particular CP 2.92; CP 5.316–317; note 2 of CP 5.402; CP 5.408; CP 5.574 and especially CP 5.582).

The essentialist approach is well illustrated in Tadiotto (2004: 3589 and 3592) and Urbain (1991: 10), where the possibility of so-called ‘essentially undecipherable cryptograms’ is discussed: in this approach, if the cryptogram is undecipherable, it is because the intrinsic code is irretrievably lost and the secret can never be uncovered. In fact the actual practice of cryptological analysis shows that A) all signs are not pre-coded, since for example a purported cryptogram may be revealed as a random transmission, i.e. noise from the channel of

transmission; B) even if the sign is pre-coded by the producer, the Analyst does not know the code beforehand and inquiry is necessary to confirm or infirm the initial hypothesis, to reach – as Peirce warns us – a firm belief but not necessary a true opinion; C) signs can have more than one interpretation, whether or not this is intended by the Producer.

Faced with an ‘undecipherable cryptogram’, a professional analyst would simply leave the matter open: when a transmission purported to be a secret message has resisted all known methods, it is either a false positive – random elements interpreted as an encrypted message – or a cleverly protected message. In such a case, it is undecided whether this is actually a cryptogram or not. Hence, the settlement of opinion: if no secret message has been uncovered by using all the methods available to the Analyst, the inquiry is suspended and the Analyst will proclaim that there appears to be no secret message. The question whether this is a true opinion or not is irrelevant, as Peirce rightly underlines.

On the other hand, it might be argued that a true opinion is reached when a secret message is actually recovered, the uncovered message itself being a proof of the truth of the opinion. There are multiple situations when that is not the case:

as mentioned above, cryptographic transformations can be recursively applied to one another, hence recovering a secret message does not preclude the possibility of yet another secret message to be uncovered;

in some specific cases of decryption, using a different transformation than the one originally used can still result in a normal appearing message, misleading the Analyst into thinking that the proper method was applied;

some methods can be used to fool the Analyst into thinking that he has found the solution, while protecting the real secret message⁷;

in some cases, the Analyst can claim to have found a secret message where there is none, especially when dealing with steganograms⁸.

Taking all this into consideration, a superficial reading of Peirce’s quote might lead to the impression that he is a relativist, that he is saying that whatever will clear our doubt will suffice for the settlement of opinion, but the quote

⁷ See Rivest (1998) and McHugh (2000) for an example of such a method; Eco (1990: 547–551) give an interesting example of such a situation.

⁸ See Kahn (1967) for an analysis of purported secret messages hidden in Shakespeare’s works; Drosnin (1997) for a method supposed to uncover secret messages in the Bible; Eco (1990: 543–547) where a purported secret message from the Templars is interpreted as a shopping list.

also refers to a ‘firm belief’, an expression that can be related to his contention that we should “. . . not pretend to doubt in philosophy what we do not doubt in our hearts” (CP 5.265). In the settlement of opinion, we are not looking for one decisive proof of our conclusion but for a multitude of well-founded arguments (ibid.).⁹

Again, this is well illustrated in the process of cryptological analysis: whether a solution has been found or not, whether a secret message is uncovered or not, the professional analyst will base his opinion on different justifications: his experience, his expertise, the time spent, the methods used, the likelihood and relevance of the purported solution and so on.

In the end the only justification for the Analyst to stop his inquiry is a belief: that every possible technique has been applied to no avail or that the message uncovered is actually the goal of the inquiry, as the case may be¹⁰. For this peaceful settlement of Belief to be rekindled into reasonable Doubt, new information has to be brought about: new analysis techniques, data from spies or other sources, information leaks, etc.

Peirce is not a relativist and particularly not a cognitive relativist: he does not say that truth is unattainable but that it is attainable at the end of an open-ended inquiry and that each inquiry step – while it is prone to error and misdirection – brings us closer to truth. In the words of T. L. Short (2007: 152):

Neither certainty nor freedom from error is attainable, but errors may progressively be eliminated, knowledge refined, extended, and deepened, and uncertainty diminished over time, as inquiry continues.

Conclusion

La réalité du monde se découvre quand nous nous heurtons à lui, quand il y a choc, rupture, brisement. Alors nous savons que le monde n’est pas tel que nous l’imaginons. (Françoise Dolto)

Cryptanalysis is a form of inquiry hence it is not surprising that we can relate it to Peirce’s characterisation of inquiry. On the other hand, this form of analysis often works on a small scale – time-wise and size-wise – so it serves as a good illustration of the intention behind his quote. In particular, cryptology supplies

⁹ On this topic, see chapter 12 of Short (2007) where the author compares peircean inquiry to prevailing contemporary relativism. See also Short 2007: 331.

¹⁰ This is also related to Peirce’s concept of the economy of inquiry, see in particular MS L75: 329–330 and the last sentence of CP 5.589.

practical real-life examples to show that: Peirce is correct in saying that the settlement of opinion is the aim of inquiry, and not true opinion as we would like to believe; truth cannot be a personal matter, it is the goal of an open-ended research and the responsibility of a community of inquirers; in that sense, the quote is not a defense of relativism, but a pragmatist stance about truth and inquiry.

The discussion of Peirce's quote also helps to diagnose and hopefully cure a certain propensity in semiotics – and in philosophy in general – to adopt a God's eye view. The illusion that all situations can be described from such a stance gives the false impression they should be seen from the all-encompassing point of view of the Producer, where signs are pre-coded, cryptological methods are known beforehand and solutions are forthcoming. Actually secret messages – by definition – can only be seen from the point of view of the Analyst, a point of view that is often underestimated, when it is not simply ignored. When faced with secret messages – as when we are faced with reality – we are all Analysts: we can only rely on Belief, nothing more but – importantly – nothing less. . .

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Cheryl Misak¹

9 Peirce on Non-Accidental Causes of Belief

[The a priori method] makes of inquiry something similar to the development of taste; but taste, unfortunately, is always more or less a matter of fashion . . . [And] I cannot help seeing that . . . sentiments in their development will be very greatly determined by accidental causes. Now, there are some people, among whom I must suppose that my reader is to be found, who, when they see that any belief of theirs is determined by any circumstance extraneous to the facts, will from that moment not merely admit in words that that belief is doubtful, but will experience a real doubt of it, so that it ceases to be a belief.

(W3: 253, 1877).

This is one passage that I have found myself returning to again and again, as I try to work out what is important in Peirce's pragmatist account of truth. It is a passage from his famous "The Fixation of Belief", one of the few papers he managed to publish in his lifetime.

The thought at the very heart of pragmatism is that our philosophical concepts must be linked to our practices. In "The Fixation of Belief", Peirce's tells us how the concept of truth must arise from our practices – our practices of inquiry, assertion, and belief. He is very careful to give us an argument that does not beg the question – one that does not presuppose a particular concept of truth while trying to excavate that very concept from our practices. He is resolute about starting with the idea that in inquiry, what we want is to settle our belief, so that we have something on which to act. His argument is that not just any old settled belief will do – it is not so easy to settle belief. He tells us that the *a priori* method, or the method of fixing belief according to what fits with the dictates of 'reason', is a 'failure.'

I have relied heavily upon this passage, as has David Wiggins (2002, 2004), in his excellent interpretation of Peirce. In it, Peirce tells us that beliefs resign in the face of recalcitrant experience or in the knowledge that they were put in place by a method that did not take experience seriously.

To see the significance of this passage, we have to take note of two kinds of pragmatism. I have argued in *The American Pragmatists* that these two kinds of pragmatism were recognized by the founders of pragmatists themselves and by their critics and supporters in the early 1900s. One kind arises from Peirce. The other arises from James.

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James sets out his view on truth and objectivity thus: “Any idea upon which we can ride . . . any idea that will carry us prosperously from any one part of our experience to any other part, linking things satisfactorily, working securely, simplifying, saving labor, is . . . true instrumentally” (1975 [1907]: 34). ‘Satisfactorily,’ for James, “means more satisfactorily to ourselves, and individuals will emphasize their points of satisfaction differently. To a certain degree, therefore, everything here is plastic” (1975 [1907]: 35). James’s version of pragmatism has a radically subjective nature, on which truth is malleable. He says: “True ideas are those that we can assimilate, validate, corroborate and verify”; “truth happens to an idea” (1975 [1907]: 97).

Here is J.B. Pratt in 1909, taking on James’s view that religious hypotheses can be believed to be true if so believing would be good for one:

Pragmatism . . . seeks to prove the truth of religion by its good and satisfactory consequences. Here, however, a distinction must be made; namely between the “good”, harmonious, and logically confirmatory consequences of religious concepts as such, and the good and pleasant consequences which come from believing these concepts. It is one thing to say a belief is true because the logical consequences that flow from it fit in harmoniously with our otherwise grounded knowledge; and quite another to call it true because it is pleasant to believe. (2001 [1909]: 186–87).

The crux of the issue between Peirce and James is as follows. Peirce thinks that the aim of reasoning is not to seek satisfaction in any sort of conclusion that feels good, but only in conclusions that fit with our ideals of getting indefeasible beliefs over the long run. We aren’t aiming at satisfaction; rather, we’re aiming at getting things right and getting things right is satisfying. James is more willing to take any sort of satisfaction to be relevant to belief acceptance. In Pratt’s terminology, the Peircean pragmatist seeks to prove the truth of a hypothesis by its good and satisfactory consequences – those that are empirically confirmed, fit with our otherwise grounded knowledge, etc. Peirce’s objection to James’s line of thought is that *passional evidence* – that one cannot, for instance, emotionally or psychologically do without the belief – is pertinent to the question of whether or not religion is good for human beings, but not pertinent to the question of whether God exists. Hypotheses about God’s existence are hypotheses about the world. Hence they need empirical verification of the usual sort.

That is, when Peirce famously suggests that true beliefs are those on which there would be agreement at the end of inquiry, he requires that the agreement be warranted by how things are, whatever that amounts to in this or that domain of inquiry. When we ask how truth is linked to our practices, we find that a true belief is one that would be ‘indefeasible’; or would not be improved upon; or would never lead to disappointment; or would forever meet

the challenges of reasons, argument, and evidence. A true belief is the belief we would come to, were we to inquire as far as we could on a matter.

This reading of Peirce was, interestingly, exactly how the young and brilliant Frank Ramsey was reading him in 1930. Ramsey died at the age of 26, in the midst of articulating a pragmatism heavily influenced by Peirce. With Peirce, Ramsey characterizes logic as the study of the habits we should adopt – both call it a ‘normative science.’ And both argue that knowledge and belief are dispositional. Ramsey says that his belief that the Cambridge Union is in Bridge Street does not flicker across his consciousness very often, but it ‘is frequently manifested’ by his turning that way when he wants a book from the Union Library. He goes there ‘habitually’, without having to think. These habits or beliefs, he argues, are judged in terms of whether or not they lead to success. Hence Ramsey rightly sees himself putting forward “a kind of pragmatism: we judge mental habits or beliefs by whether they work” (1990 [1926]: 93–4).

Ramsey is usually taken to be a straight redundancy theorist who thinks that the predicate ‘is true’ can always be eliminated by simply asserting the sentence in question. He says that “A belief is true if it is a belief that p and p ’ ‘is merely a truism, but there is no platitude so obvious that that eminent philosophers have not denied it” (1991 [1930]: 12). Ramsey, however, does not think we can rest with the platitude. He goes on to put forward a Peircean view on which truth is an attribute of a belief, judgment, or assertion and he argues that once we have found out what is good by way of belief, we will have solved the problem of truth. Ramsey rejects James’s version of pragmatism (indeed, he thinks that James probably denies the preceding truism). The pragmatist should not hold that ‘ p is true’ is identified with ‘ p is useful’. For the belief that p will be useful **only if** p . My belief that arsenic is poisonous will manifest itself by my abstaining from ingesting it. That is a useful habit for me to have. But it is useful because of what Ramsey calls ‘objective’ factors – for instance, that arsenic is actually poisonous. That is a non-accidental cause of my belief that arsenic is poisonous. My belief is determined by circumstance not extraneous to the facts. Ramsey, having got his hands on the very first anthology of Peirce’s writings – the 1923 *Chance, Love, and Logic* – seems also to have seen the importance of that passage from ‘The Fixation of Belief’ upon which I have so heavily relied.

Henrik Rydenfelt¹

10 Scientific Method and the Realist Hypothesis

Such is the method of science. Its fundamental hypothesis, restated in more familiar language, is this: There are Real things, whose characters are entirely independent of our opinions about them; those Reals affect our senses according to regular laws, and, though our sensations are as different as are our relations to the objects, yet, by taking advantage of the laws of perception, we can ascertain by reasoning how things really and truly are; and any man, if he have sufficient experience and he reason enough about it, will be led to the one True conclusion. The new conception here involved is that of Reality. It may be asked how I know that there are any Reals. If this hypothesis is the sole support of my method of inquiry, my method of inquiry must not be used to support my hypothesis. The reply is this:

1. If investigation cannot be regarded as proving that there are Real things, it at least does not lead to a contrary conclusion; but the method and the conception on which it is based remain ever in harmony. No doubts of the method, therefore, necessarily arise from its practice, as is the case with all the others. 2. The feeling which gives rise to any method of fixing belief is a dissatisfaction at two repugnant propositions. But here already is a vague concession that there is some one thing which a proposition should represent. Nobody, therefore, can really doubt that there are Reals, for, if he did, doubt would not be a source of dissatisfaction. The hypothesis, therefore, is one which every mind admits. So that the social impulse does not cause men to doubt it. 3. Everybody uses the scientific method about a great many things, and only ceases to use it when he does not know how to apply it. 4. Experience of the method has not led us to doubt it, but, on the contrary, scientific investigation has had the most wonderful triumphs in the way of settling opinion. These afford the explanation of my not doubting the method or the hypothesis which it supposes; and not having any doubt, nor believing that anybody else whom I could influence has, it would be the merest babble for me to say more about it. If there be anybody with a living doubt upon the subject, let him consider it. (EPI: 120, 1877).

In “The Fixation of Belief”, Peirce discusses *inquiry* as the move from the unsettling state of doubt to the settlement of opinion, or belief. He distinguishes four different ways of settling opinion, or aims of inquiry. The first of the methods is tenacity, the steadfast clinging to one’s opinion. However, under the influence of what Peirce calls the “social impulse”, this method is bound to fail. The disagreement of others begins to matter, and the question becomes: how to fix beliefs for *everyone*.

The three latter methods attempt to reach a shared opinion across believers. By the method of authority, a power such as that of the state forces a single opinion upon everyone, by brute force if required. But a “wider sort of social

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feeling” will show that the opinions dictated by the authority are mostly arbitrary (Peirce 1877: 118).² The *a priori* method attempts to rectify this problem by demanding that opinion is to be settled, under conditions of liberty, by what is agreeable to human reason. However, this method leads to no lasting results: it “makes of inquiry something similar to the development of taste; but taste, unfortunately, is always more or less a matter of fashion” (ibid.: 119).

It is required to develop a method which does not make our belief dependent on our subjective opinions and tastes altogether, but “by which our beliefs may be determined by nothing human, but by some external permanency” (ibid.: 120). This method is the scientific one. Truth, from its point of view, is the opinion which accords with a reality independent of our opinions of it. The hypothesis that underlies the scientific method is that there is an independent reality, which “affects, or might affect, every man” (ibid.: 120). This *hypothetical realism* finally makes intelligible the attainment of a single answer to any question across inquirers.

Contemporary scientific realists commonly attempt to show that science is a reliable guide to what there is. Peirce takes the opposite direction: it is science that is defined in terms of reality. (Of course, this is not to deny that the abstract definition of science presupposes and builds upon a reflection of its concrete development). This direction of definition leads to the distinctive features of Peircean scientific realism. The scope of science is not limited to any particular set of theories or some specific methodical outlook, for example one conceived of in terms of a paradigmatic science such as physics. Instead, scientific inquiry is an inquiry that has as its aim finding out how things are independently of how we think they are.³ Reality, in turn, is not defined in terms of the results or methods of (some particular) science, present or future.

The scientific method is distinguished from the others by its realist hypothesis; accordingly, Peirce points out that the method itself cannot be used to support it. Instead of attempting to show that there is an independent reality by way of scientific inquiry, as it were, Peirce offers four considerations that in his words “afford the explanation” of his not doubting the method or its underlying hypothesis.

² References to “Fixation” are to the text as printed in *The Essential Peirce* vol 1.

³ Some readers of Peirce have argued that the scientific method is defined by, or distinguished from the others, by its making our belief sensitive to experience, argumentation, reasoning, or the like. Among these readers, I’m indebted to an anonymous referee, and have two criticisms to make. Firstly, it is clear based on textual evidence that, *at least* in the “Fixation”, the distinguishing feature of the scientific method is the realist hypothesis. Secondly, what counts as relevant experience, argument or reasoning is already a matter of the choice of method. We will not be able to tell the scientific method apart from the others by reference to such notions – that is, unless the realist hypothesis is invoked in connection to them.

The first of the four considerations is that the application of the scientific method will not lead to the contrary conclusion – the conclusion that there is no independent reality. Peirce then adds that the scientific method is distinct from the others in that no doubts of that method necessarily arise from its practice. On the first count, Peirce is surely correct. It would be impossible for the scientific method to ever show that there are no real things: after all, this would amount to showing that, independently of our opinions, there is nothing independent of our opinions.

However, it is less evident that such a consistency in application is particular to the scientific method. Consider the crudest method, tenacity, which holds that the true opinion is that which one already maintains. Surely, for someone who consistently follows this method, the disagreement of others will simply not matter, and doubts over the method brought about by the conflicting views of other inquirers will not arise *within* its practice. Indeed, when discussing the tenacious person, Peirce himself points out that it “would be an egotistical impertinence to object that his procedure is irrational, for that only amounts to saying that his method of settling belief is not ours” (EPI: 116). Doubt over this method *does* arise, but not *necessarily* out of the practice of *that* method. Rather, for the “social impulse” to have its bite, we must have already proceeded beyond tenacity to a public method of fixing belief. As it turns out, none of the four methods Peirce discusses is inconsistent or self-defeating in like manner. For example, there is no *a priori* proof that the *a priori* method will not lead to any lasting results. For this reason, consistency cannot be listed as a benefit specific to the scientific one.

The social impulse explicitly appears in Peirce’s second consideration. Here his argumentation here is rather complex. The first prong of the argument appears to be that the fact of doubt itself implies the belief that there is some “one thing” that our beliefs represent, and hence the belief in an independent reality is pre-supposed. The second prong is almost unexpected. From his claim that everyone already agrees about the realist hypothesis – which we could easily think would be quite sufficient to his purposes – he further infers, as if by way of conclusion, that the social impulse will not count against the scientific method. This prong is however central to Peirce in light of the discussion of the “Fixation”: it is the influence of such an impulse that motivated the move from tenacity to the method of authority and then onwards to the *a priori* method.

This line of argument is too hasty. It certainly is not evident that the demand of consistency can only be due to the realist hypothesis. Recalling the pragmatist’s insistence that beliefs are habits of action which may actualize in conduct under some conceivable circumstances, the impossibility of simultaneously embarking on two mutually exclusive courses of action might be a natural

source for the dissatisfaction at two inconsistent beliefs, perhaps even for a rudimentary notion of the law of contradiction. But this natural pursuit of consistency does not equal the belief in an independent reality. The very existence of doubt does not equal the realist hypothesis. Moreover, the other methods already entail the notion of one and only one opinion being the correct one. By the method of authority, for example, the “one thing” that our opinion is to accord with is the view dictated by the authority. That our opinions are to accord with some “one thing” does not yet yield the admission of the realist hypothesis.

There is a further, more general reason to think that it cannot be that each belief represents an independent fact in some straightforward fashion. Namely, if this *were* the case, Peirce’s whole discussion would be moot, and the scientific method would win by default: it would be simply impossible to follow methods other than the scientific one. Perhaps, as Peirce puts it, each proposition *should* be taken to represent a fact. But this notion appears with the scientific method alone.

The third consideration repeats this idea by maintaining that the scientific method is used by everyone “about a great many things”. Common sense, from the Peircean perspective, is often a rudimentary form of science: it may involve far less refined methods of investigation, but nevertheless entail the assumption of an independent reality. In some domains of belief (and inquiry), however, the scientific method is not commonly followed. Normative questions such as issues concerning the rightness and wrongness of actions could serve as a central example. In the absence of a well-formed normative science, we often resort to the other methods in settling moral opinion.

The main problem with the third consideration is that it appears to take place from the point of view of another method, namely the third, *a priori* one: it lists consensus as speaking for the hypothesis. From the point of view of the scientific method, too, agreement across inquirers is obviously central. In the same connection, Peirce himself familiarly articulates truth as that view which inquirers would agree upon, were investigation pursued indefinitely. But such agreement – often dubbed convergence – derived in an inquiry that attempts to be responsive to the influence of an independent reality through experience, is distinct from a simple consensus, which might be coincidental. Moreover, considerations pertaining to the agreement achieved among inquirers will be irrelevant from the perspective of those who haven’t attained at least the third, *a priori* method of fixing belief.

Finally, in his fourth consideration Peirce argues that experience of application of that method will not count against it, but rather shows its “wonderful triumphs”. If anything, however, drawing from our *experience* in applying the method is an instance of the application of that method itself. As Peirce notes

at the outset of his discussion, it cannot be used to support the realist hypothesis. No matter how plausible the concrete results of science, including the technological advancements it has enabled, may make that hypothesis to some, for those who rather follow another method, no amount of such experience will count as the relevant type of evidence. Peirce would likely maintain that inquirers will eventually converge, under the influence of reality through experience, upon the scientific method. In advance of this development in any particular field of inquiry, however, such experience and the convergence of opinion under its influence will not be considered relevant.

All in all, none of Peirce's four considerations succeeds in giving the scientific method and its realist hypothesis an unquestionable advantage over the other methods, which do not involve such a hypothesis. To recapitulate, the first consideration imposes a demand of consistency that is met by each of the four methods Peirce presents. The second consideration maintains that there must be some one thing that our opinions are settled in accordance with, but all of the three latter methods answer to this demand. Peirce's further insistence that the external standard must be an independent reality seems exaggerated: it cannot be that our beliefs represent a reality in a manner that would make the non-scientific methods superfluous.

The third consideration, which draws from the wide appeal of the scientific method (and thus of its underlying hypothesis) is motivated by the *a priori* stance rather than the scientific method. Finally the fourth consideration which centers on the experiences resulting from the application of the method is itself an application of that method. It cannot be used to defend the hypothesis that underlies that method itself: that such experience is the experience of our opinion being settled in accordance with an independent reality.

But of course, we should not read these considerations as an attempt to give a full-blown proof to the realist hypothesis – otherwise it would not be a hypothesis at all. As Peirce is quick to point out, these four considerations rather explain why he entertains no doubt about its feasibility. The most important defense of the realist hypothesis is ultimately that which Peirce states subsequent to the four considerations: “If there be anybody with a living doubt upon the subject, let him consider it”. There is no argument that would overturn a skeptic about reality; neither can we supply a method-neutral defense of the scientific method. In line with the idea that reality would ultimately impose the scientific method upon all inquirers, the true response to the doubter and the follower of another method is “wait and see”.

Admitting the impossibility of *showing* that the realist hypothesis is the correct or even the most rational one is still no reason to rest content with others applying the three other methods. Instead, there is work to be done in aiding the

expansion of the scientific outlook. In particular, there are cases of inquiry – such as that of moral or more generally normative claims already considered – that do not easily allow themselves to the scientific method. Both philosophical conceptual work and scientific discovery may be required to bring different domains of inquiry into the scientific fold.

Gary Richmond¹ & Ben Udell²

11 Logic is Rooted in the Social Principle (and vice versa)

It seems to me that we are driven to this, that logicity inexorably requires that our interests shall not be limited. They must not stop at our own fate, but must embrace the whole community. This community, again, must not be limited, but must extend to all races of beings with whom we can come into immediate or mediate intellectual relation. It must reach, however vaguely, beyond this geological epoch, beyond all bounds. He who would not sacrifice his own soul to save the whole world, is, as it seems to me, illogical in all his inferences, collectively. Logic is rooted in the social principle. (EPI: 149, 1878).

1 Logic is rooted in the social principle (1)

In 1877 and 1878 *Popular Science Monthly* published a series of six essays by Peirce known as *Illustrations of the Logic of Science*, the first two essays in the series, “The Fixation of Belief” and “How to Make Our Ideas Clear”, being among Peirce’s best known and most referenced works, and rightly so, as they introduce several seminal logical conceptions which he will continue to develop throughout his philosophical career. These include the argument that the method of science is superior to other approaches to settling beliefs, along with the introduction of the pragmatic maxim into scientific methodology, an intellectual move involving a theory of reality which will develop into the “extreme Scholastic realism” of his mature thinking. The richness of these ideas and their development over time by Peirce preclude extensive treatment in this short paper, which will focus on and around the role that the reasoner’s interests play in the validity of reasoning. The quotation above is from the third in the *Illustrations* series, “The Doctrine of Chances” (1878), not quite as well-known outside of Peirce scholarship, but perhaps in its own way as important as the two other essays. It draws heavily on the ideas articulated in those seminal articles while developing them somewhat further in the direction of a reflection on probability, analyzing it in light of the pragmatic maxim earlier enounced in “How to Make Our Ideas Clear”. The importance of the essay lies, in part, in Peirce’s claiming a special value of the concept of continuity for logic. Indeed,

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as Nathan Houser has remarked, it can be seen as “an early discussion of what was to become his synechism”. (EPI: 142).

Peirce begins “The Doctrine of Chances” with remarks on the value of mathematics for science, quickly clarifying that he is not considering number here, but *continuous quantity*. While number presents science with the possibility of extraordinary precision, Peirce argues that, perhaps even more importantly, continuous quantity leads to some of science’s “finest generalizations”. He points in particular to the “naturalist’s” use of the concept of continuity, one which leads him to wield bold generalizations as hypotheses. While he does not mention him here, Peirce would certainly have included among these the boldest of the bold generalizing naturalists of the 19th century, Charles Darwin, whose *Origin of Species* had appeared but a little more than two decades prior to the *Illustrations of the Logic of Science* series.

This idea of continuity leads Peirce to a preliminary consideration of what constitutes “differences of degree”. He begins this section of the paper by commenting that probability theory “is simply the science of logic quantitatively treated”.

The general problem of probabilities is, from a given state of facts, to determine the numerical probability of a possible fact. This is the same as to inquire how much the given facts are worth, considered as evidence to prove the possible fact. Thus the problem of probabilities is simply the general problem of logic. (EPI: 144)

Probability being “the general problem of logic”, it would seem to follow that “great advantages may be expected from this mode of studying logic”. As an initial step in considering this critical issue, and employing the pragmatic maxim which he had recently introduced, Peirce sets out to analyze what is meant by *probability* by considering “what real and sensible difference there is between one degree of probability and another”.

The first thing that one needs to remark is that Peirce’s argument will not be based on any psychological theory, for he had already shown in “The Fixation of Belief” that there can be no psychological basis for logic because “the validity of an inference does not depend on any tendency of the mind to accept it”. In place of psychology, Peirce offers what he terms the *logical mind*:

[I]n a logical mind an argument is always conceived as a member of a *genus* of arguments all constructed in the same way, and such that, when their premises are real facts, their conclusions are so also. If the argument is demonstrative, then this is always so; if it is only probable, then it is for the most part so. (EPI: 146).

Peirce then provides a remarkably succinct basic ‘calculus of probability’ to suggest the principal reason why he can say that probability theory’s fundamental principles really cannot be in dispute – they’re just too simple.³ Yet a simple mathematical calculation of the probability of an event “without naming the conditions” is, Peirce says, meaningless, an empty abstraction; it is necessary to ground oneself in reality or miss the whole point of logic, that is, to miss its pragmatic point – that the general tendency of logic is to move in the direction of revealing some truth of reality. So, following Venn,⁴ but adding certain critical ideas he’d set forth in the two earlier papers, Peirce concludes:

[T]he distinction of reality and fiction depends on the supposition that sufficient investigation would cause one opinion to be universally received and all others to be rejected. That presupposition, involved in the very conceptions of reality and figment, involves a complete sundering of the two. It is the heaven-and-hell idea in the domain of thought. (EPI: 146).

The logical fullness of the expression of this reality depends on the truth of an investigation taken far enough, which is to say that it is only possible if it involves an unlimited community of logical minds over conceivably vast periods of time. The truth “will out” if we seek it long enough and hard enough.

[I]n the long run, there is a real fact which corresponds to the idea of probability, and it is that a given mode of inference sometimes proves successful and sometimes not, and that in a ratio ultimately fixed. . . . We may, therefore, define the probability of a mode of argument as the proportion of cases in which it carries truth with it. (EPI: 146).

In sum, pragmatic investigation by its very nature necessarily requires a community of inquiry so vast in breadth and depth and duration as to be *essentially* unlimited. Along the way the *logical mind* will learn many things about the nature of reality, some, no doubt, of potential value to humanity.

2 Retrospective: The social Principle is rooted in logic

A decade earlier, in 1868–1869, the *Journal of Speculative Philosophy* published three papers by Peirce in which he argues that continuity and generality are real and the various modes of inference are valid. In the third paper, “Grounds

³ For this calculus, see: EPI: 146–7; W3: 281; CP 2.651.

⁴ EPI: 147 Fn.; W3: 281 Fn.; CP 2.651 Fn.

of Validity of the Laws of Logic: Further Consequences of Four Incapacities” (1869), he argues that probable inference, meaning at this time induction and hypothetical inference,⁵ is irreducible to deduction, and that induction’s validity depends not on some determinate state, in particular an orderliness, of the universe (which would also be a roundabout way to recast induction as deduction), but on the capacity to sample randomly and on the reality – which is also the cognizability – of general characteristics and of being as general. He goes on to argue that, although induction helps increase our knowledge, it is not even true that inductions generally conclude in real facts beyond such as are in their premisses: “[W]e cannot say that the generality of inductions are true, but only that in the long run they approximate to the truth.”⁶ The validities of induction and hypothesis depend on the correctability of the inferences in a long run not limited to the reasoner’s lifespan; they depend on the idea of an indefinitely large community.

Peirce turns finally to the question of how interests affect the validity of one’s inferences. The reasoner must identify with the interest of an indefinitely large community in order to infer with validity, insofar as such validity depends on those reasonings’ eventual correctability. He then argues that, like an insurance company, one has no security if one assumes a *particular* risk greater than the sum of one’s other risks. Peirce asks: “Now, has not every single man such a risk? What shall it profit a man if he shall gain the whole world and lose his own soul?”⁷ For his second question Peirce has quoted, disapprovingly as it turns out, Jesus’ rhetorical question stated, in Matthew 16:26 and Mark 8:36, after Peter has rebuked Jesus for intending to submit to prolonged agony and execution and after Jesus has rebuked Peter in turn: “Get thee behind me, Satan”. Peirce counters that a transcendent personal interest, in one’s own soul or in any other personal thing, invalidates all of one’s inferences. Any doubts of Peirce’s startling meaning as to the soul dissolve when he says,

... logic rigidly requires, before all else, that no determinate fact, nothing which can happen to a man’s self, should be of more consequence to him than everything else. 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. (EPI: 81).

5 “All probable inference, whether induction or hypothesis, is inference from the parts to the whole. It is essentially the same, therefore, as statistical inference.” – EPI: 78; W2:268; CP 3.349. In later writings Peirce discusses that which he calls *probable deduction* (e.g., “The Law of Mind”, EPI: 329; W8: 152; CP 6.147 and “Syllabus” EPII: 298; CP 2.267–8) but such is not to be confused with his remarks on *probable inference* in “Grounds of Validity”.

6 EPI: 79; W2:268; CP 3.350.

7 EPI: 81; W2:270; CP 3.354.

In the Biblical context, familiar to Peirce and his expected audience, Jesus means that he would rather suffer a death prolonged and agonizing for the highest cause, than trade his soul to Satan. Most likely, Peirce simply rejects the idea that a personal self-interest, even as to one's soul, can somehow, as a rule, be for a greater good.⁸ He goes on to argue that what is not only logical but common, even the rule, is not hedonism but self-identification with the interest of a larger and open-ended community.⁹ To grasp the necessity of such identification for valid reasoning, argues Peirce, is to identify with the person having the power of self-sacrifice, and that grasp redeems one's own logicity, even if one does not completely identify with the community.¹⁰ He argues that *private* logicity is not fully established by this, since there is, in turn, no point in weighing, or otherwise trifling with, the long-run hope for the best for the community, since all depends on it.¹¹

What in "Grounds of Validity" is the *inconceivability* that inductive and hypothetical inference could fail no matter how far they are taken,¹² becomes for Peirce in *Illustrations of the Logic of Science* the *incredibility* of such failure¹³, and finally the inquiry-regulative *hope* of their success; but it is the kind of hope which, Peirce says, one cannot seriously doubt in particular cases.¹⁴ Thus it still supports not only theory but also conduct in the most urgent of matters.

3 Conclusion: Logic is rooted in the social principle (2)

Returning now to the "The Doctrine of Chances", in the penultimate section of that article Peirce echoes the idea, first stated in 1869, that one cannot reason from isolated cases, now baldly stated: "there can be no sense in reasoning in an isolated case at all". Furthermore, for a finite life there is simply not enough

⁸ That is, even let it be supposed that it could never serve the greater good to sell out literally to the devil, still one's refusal to do so ought to be in view of the greater good, not in view of the good of one's own soul or in fear of hell.

⁹ EPI: 81; W5: 271; CP 5.355.

¹⁰ EPI: 81; W5:271; CP 5.356.

¹¹ EPI: 81-2; W5:271-2; CP 5.357.

¹² EPI: 80; W2:270; CP 3.353.

¹³ In "The Probability of Induction", 1878, see EPI: 164-5; CP 2.684.

¹⁴ In "MS L75: Logic, Regarded as Semeiotic (The Carnegie application of 1902)", Joseph Ransdell, editor, *Arisbe* website, p. 361-2 in Final Version of "Memoir 10. On the Presuppositions of Logic".

time for anything approaching an “in the long run” – quite the contrary. Employing a gambling metaphor as he did in 1869, Peirce remarks:

Now the number of risks, the number of probable inferences, which a man draws in his whole life, is a finite one, and he cannot be absolutely certain that the mean result will accord with the probabilities at all. Taking all his risks collectively, then, it cannot be certain that they will not fail . . . It is an indubitable result of the theory of probabilities that every gambler, if he continues long enough, must ultimately be ruined. (EPI: 148).

Peirce remarks that were anyone to live forever, he would see his complete and total ruin and that of all of those around him.

All human affairs rest upon probabilities, and the same thing is true everywhere. If man were immortal he could be perfectly sure of seeing the day when everything in which he had trusted should betray his trust, and, in short, of coming eventually to hopeless misery. He would break down, at last, as every great fortune, as every dynasty, as every civilization does. In place of this we have death. (EPI: 149).

Since we cannot be certain of the “mean result” of all our probable inferences, the only idea which logically supports real human hope is that of an *unlimited community* of vast scope and duration.

But what, without death, would happen to every man, with death must happen to some man. At the same time, death makes the number of our risks, of our inferences, finite, and so makes their mean result uncertain. The very idea of probability and of reasoning rests on the assumption that this number is indefinitely great. We are thus landed in [an inescapable logical problematic], and I can see but one solution of it. It seems to me that we are driven to this, that logicity inexorably requires that our interests shall not be limited. They must not stop at our own fate, but must embrace the whole community. This community, again, must not be limited, but must extend to all races of beings with whom we can come into immediate or mediate intellectual relation. It must reach, however vaguely, beyond this geological epoch, beyond all bounds. He who would not sacrifice his own soul to save the whole world, is, as it seems to me, illogical in all his inferences, collectively. Logic is rooted in the social principle. (EPI: 149).

In Peirce’s view the individual has no reality apart from a community, and this is so in a number of senses (for example, each person is necessarily a member of one or more language communities). This is, of course, a version of the familiar notion which John Donne expressed so beautifully, that “no man is an island”.¹⁵ Echoing Donne, in a well-known passage in “How to Make Our Ideas Clear”, Peirce comments that “individualism and falsity are one and the same”, and that one’s “experience is nothing, if it stands alone”. In a page added as a note

¹⁵ “No man is an island, entire of itself . . . I am involved in mankind”. John Donne, *Mediation* XVII.

to the first appearance of the pragmatic maxim occurring in “How to Make Our Ideas Clear”, Peirce writes:

When we come to study the great principle of continuity and see how all is fluid and every point directly partakes the being of every other, it will appear that individualism and falsity are one and the same. Meantime, we know that man is not whole as long as he is single, that he is essentially a possible member of society. Especially, one man’s experience is nothing, if it stands alone. . . . It is not “my” experience, but “our” experience that has to be thought of; and this “us” has indefinite possibilities. (CP 5.402 Fn P2 Para 3/3: 259).

Further, that logic is indeed rooted in *our* experience – that is, in the *social principle* – implies that to be logical people should not be selfish and, indeed, Peirce argues that there are clear enough signs that people are not really as selfish as some may think.

To be logical men should not be selfish; and, in point of fact, they are not so selfish as they are thought. The willful prosecution of one’s desires is a different thing from selfishness. . . . We discuss with anxiety the possible exhaustion of coal in some hundreds of years, or the cooling-off of the sun in some millions. (EPI: 149).

Mutatis mutandis, we could no doubt come up with many contemporary examples (such as anxiety regarding the effects of climate change over the next 100 years). Still, and perhaps even in our own time, the clearest and most poignant example of the kind of selflessness that is possible for individual persons is that of the soldier who courageously risks his life for his fellows.

Sometimes we can personally attain to heroism. The soldier who runs to scale a wall knows that he will probably be shot, but that is not all he cares for. He also knows that if all the regiment, with whom in feeling he identifies himself, rush forward at once, the fort will be taken. (EPI: 149).

Such a person, *this* soldier – a hero – has identified himself with his comrades, or his country, or “freedom”, etc. such that he is willing to sacrifice himself because of that identification. In a letter to Lady Welby, Peirce deepens this line of analysis to include the idea that the selflessness that the soldier shows is such that his personal success is not the principal point. Rather, in Peirce’s view, the soldier’s confidence is *a sign of a more general kind of spirit*. He comments: “As for my example about the soldier, don’t mistake the point. His confidence may cause his success. But that is not what I mean. His confidence is a reason for thinking that he will succeed: it is a sign of that sort of spirit that does succeed”.¹⁶

¹⁶ Letter to Lady Welby, 25, May 1911, in: *Letters to Lady Welby* (1953), p. 46; *Values in a Universe of Chance* (1958): 432; *Semiotic and Significs* (1977): 147.

Yet one doesn't have to be, nor *can* everyone actually be that self-sacrificing hero, say for no other reason than that the opportunity never arises for him to show that extent of identity and courage. Peirce makes clear; however, that it is not necessary to actually be a hero, that all that is required is that a person recognizes that the *kind of selflessness* which the hero displays would be the logical thing for any sane and humane person to do.

Now, it is not necessary for logicity that a man should himself be capable of the heroism of self-sacrifice. It is sufficient that he should recognize the possibility of it, should perceive that only that man's inferences who has it are really logical, and should consequently regard his own as being only so far valid as they would be accepted by the hero. This makes logicity attainable enough. (EPI: 149).

Yet in order to have logicity increase – that is, in order that many more of us should begin to act precisely in the interest of *us* – there would need to be a more general sense of a reality – a *life* – extending beyond one's own and embracing a veritable unlimited community of which one is a part.

But all this requires a conceived identification of one's interests with those of an unlimited community. Now, there exist no reasons . . . for thinking that the human race . . . will exist forever. On the other hand, there can be no reason against it; and, fortunately, as the whole requirement is that we should have certain sentiments, there is nothing in the facts to forbid our having a hope, or calm cheerful wish, that the community may last beyond any assignable date. (EPI: 150).

And so Peirce concludes “The Doctrine of Chances” by remarking that logic rests on three social sentiments, these following from a principle he'd previously established, namely, that logic begins in a “struggle to escape doubt”, suggesting that not only is feeling there from the get-go but, further, that only the *logical mind* can learn in a manner securing a solid basis for such action as might relieve that doubt.

It may seem strange that I should put forward three sentiments, namely, interest in an indefinite community, recognition of the possibility of this interest being made supreme, and hope in the unlimited continuance of intellectual activity, as indispensable requirements of logic. Yet, when we consider that logic depends on a mere struggle to escape doubt, which, as it terminates in action, must begin in emotion, and that, furthermore, the only cause of our planting ourselves on reason is that other methods of escaping doubt fail on account of the social impulse, why should we wonder to find social sentiment presupposed in reasoning? (EPI: 150).

So, for Peirce, the social sentiment, deep concern for one another, *caritas, agape*, the self-less love of each for each other represents the logical superstructure of

logical inquiry, which is itself supported by those two other great pillars of logic: faith that such love (*caritas*) can indeed be wholly generalized, and hope that profoundly significant human inquiry may continue indefinitely.

It interests me to notice that these three sentiments seem to be pretty much the same as that famous trio of Charity, Faith, and Hope, which, in the estimation of St. Paul, are the finest and greatest of spiritual gifts. (EPI: 150).

These sentiments are, for Peirce, “the finest and greatest of spiritual gifts”, indeed, “the dispositions of heart which a man ought to have”. They represent the hope that each of us might act in the interest of the human community towards the furtherance of our *summum bonum*, in Peirce’s view, the advancement of humanity’s critical commonsense. And so it becomes clearer that *logic seen as grounded in the social principle which is in turn grounded in logic*, rather than being the expression of a logical circularity, is the potentially fruitful abduction that they are in truth grounded in each other. Nurturing such a logical-social disposition – the logical mind – could afford each of us the sense of the great value of pressing his or her shoulder to the wheel “for an end that none of us can catch more than a glimpse at – that which the generations are working out”.¹⁷

¹⁷ CP 5.402 Fn. P2 Para 3/3:259.

John R. Shook¹

12 Reasoning is Communal in Method and Spirit

It may seem strange that I should put forward three sentiments, namely, interest in an indefinite community, recognition of the possibility of this interest being made supreme, and hope in the unlimited continuance of intellectual activity, as indispensable requirements of logic. Yet, when we consider that logic depends on a mere struggle to escape doubt, which, as it terminates in action, must begin in emotion, and that, furthermore, the only cause of our planting ourselves on reason is that other methods of escaping doubt fail on account of the social impulse, why should we wonder to find social sentiment presupposed in reasoning? As for the other two sentiments which I find necessary, they are so only as supports and accessories of that. It interests me to notice that these three sentiments seem to be pretty much the same as that famous trio of Charity, Faith, and Hope, which, in the estimation of St. Paul, are the finest and greatest of spiritual gifts. (CP 2.655, W3: 285, 1878).

This quotation from “Illustrations of the Logic of Science: The Doctrine of Chances” (1878) is found among Peirce’s most detailed and explicit statements of his social theory of logic. Other statements include passages from “Grounds of Validity of the Laws of Logic: Further Consequences of Four Incapacities” (CP 5.356–357; W2: 271–272), and his famous statement from “How to Make Our Ideas Clear” that “The opinion which is fated to be ultimately agreed to by all who investigate, is what we mean by the truth, and the object represented in this opinion is the real” (CP 5.407; W3: 273).

It is one thing to hold that our conception of truth and reality is logically connected with our conception of inquiry indefinitely extended. It appears to be quite another thing to hold that our very capacity to be reasonable and logical is bound up with our moral commitments to some hypothetical community undertaking all that inquiry. Can’t a person be quite logical, as far as they are able, independent from anyone else’s capacity to be logical as well? Don’t we confront the supreme truth of logic individually, to be judged as illogical separately and blamed separately? No one is saying that any typical person’s logicity reaches perfection alone; but what average logicity a person may possess surely can’t depend on how logical a neighbor may happen to be. Why must I have any social concern for my neighbor’s reasonableness in order to preserve my own? Finding social commitments at the heart of rationality is radical enough; declaring social sentiments and even virtues to be necessary for logic

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seems impossible. Besides, doesn't Peirce repeatedly warn against reducing logic and the validity of its norms to what any number of people are able to feel or think? Logic cannot be reduced to psychology, since logic is about what reasoning ought to be. Minds are right to use logic because of its independent validity, not because many minds happen to already be somewhat logical (see e.g. CP 2.7; CP 2.52; CP 2.55; CP 5.125).

We must ask why logic's independent validity would involve anything about people or groups of people. Peirce's answer is that logic deals with the contingent validity of actual thinking about realities through signs, unlike mathematics, which concerns pure relations necessarily holding between abstract conceptions. "Logic is the theory of self-controlled, or deliberate, thought; and as such, must appeal to ethics for its principles. It also depends upon phenomenology and upon mathematics. All thought being performed by means of signs, logic may be regarded as the science of the general laws of signs" (CP 1.191). Logic concerns "the process of inference, or the self-controlled formation of new belief on the basis of knowledge already possessed" (CP 7.276). What is inference? "Logic is obliged to suppose (it need not assert) that there is knowledge embodied in some form, and that there is inference, in the sense that one embodiment of knowledge affects another". (CP 2.66) By 'knowledge' Peirce never means justified true belief, since the truth of a belief is what knowledge aims for and never takes for granted (since all knowledge is fallible). Rather, knowledge is simply justified (so far) belief, which grew from past learning and is presently relied upon. If there is perfect knowledge attained now, no one could know that: "Perhaps we may already have attained to perfect knowledge about a number of questions; but we cannot have an unshakable opinion that we have attained such perfect knowledge about any given question" (CP 4.63).

The instability and unreliability of knowledge, so far as anyone can tell, makes an odd contrast with Peirce's insistence on the absolute validity of logical laws for inference. That perfect validity is contaminated, so to speak, with the way that premises of knowledge about facts are involved with all inference (unlike inferences in pure mathematics). Suppose one reasons that "Given any event A (granting conditions C), then event B occurs". What makes this proposition actually true? Only the reality that B occurs wherever and whenever A-in-C occurs. Where is this truth-making reality? Anywhere that A-in-C could occur – potentially anywhere in the universe, now or into the future. Practical reasonings about trees from seeds and toast from toasters don't involve the whole universe, yet a vast four-dimensional space-time region on and near earth into its future is still involved. Theoretical science potentially involves the entire cosmos from its origin to its destiny. Knowledge aims at truth, which is to say reality, so any particular instance of reasoning is but a sampling of all possible

tests of this reality. “[R]easoning may not be logical, because the rule may involve matter of fact, so that the reasoner cannot have sufficient ground to be absolutely certain that it will not sometimes fail. The inference is only logical if the reasoner can be mathematically certain of the excellence of his rule of reasoning; and in the case of necessary reasoning he must be mathematically certain that in every state of things whatsoever, whether now or a million years hence, whether here or in the farthest fixed star, such a premiss and such a conclusion will never be, the former true and the latter false” (CP 4.477).

No actual reasoner will be in a personal position to know about the cosmos’s total compatibility with an inference. As a lone reasoner, a person has access to only an infinitesimal sampling of reality for facts and confirmations of inferences. Nevertheless, reasoners do place firm confidence in their inferences in order to live. Skeptics unable to find guaranteed knowledge about the world have an ally in Peirce, but those who play at total skepticism towards any partial knowledge are alone (and complete skeptics are non-existent). People controlling the modification of their body of knowledge with beliefs acquired from inference are practically committed to the validity of those inferences. Hence there are logical sentiments. Not only do people reason for a purpose, they reason with purpose. When they reason, they do it with purpose by selecting reason, reasoning with care, and committing to where reason leads. When reasoning occurs, people are willfully controlling their minds in habitual, methodical ways with the aim of growing knowledge towards truth.

Another odd contrast arises here, between people committing to the growth of their own knowledge through inferences, and Peirce’s insistence that only all relevant reality could make those inferences valid and true. Why should Peirce expect people to commit to matters which by definition they shouldn’t think has much chance of being true? Given the enormity of reality, the only reasonable person may be the one who admits, “My little body of mere opinions from my own experience is barely enough to live on, and it shall have to suffice, for I haven’t hardly any reason sufficient for knowing more”. This humble skeptic, if truly unable to communicate knowledge with others, would only grow a miniscule amount of learning and regard every chain of inference with great suspicion. But the lone inquirer is logically impossible – nothing which this lone inquirer does to relieve doubt (if any arose) and grow knowledge could be done with any confidence, so this person could not be logical at all. A less humble skeptic won’t commit to any logical rules until they are logically justified, and then complains that neither foundational nor circular justifications can suffice, leaving this skeptic without a logic and hence without any knowledge or reason.

The only reasonable people are those taking the growth (however limited) of their knowledge to be real. If growth of knowledge is real, then logical inquiry

cannot be solitary, and hence logicity must be communal. Communal inquiry requires communication of knowledge, in turn requiring not only the acceptance of facts from others, but also the acceptance of others' inferences. Naturally, one would refuse to accept others' knowledge if no confidence could be placed in them, but on the supposition that growth of knowledge is anywhere real, one must logically place some confidence in the knowledge of others. This credulity towards others' knowledge both arouses doubts towards one's own knowledge as well as inspires joint inquiry to improve knowledge. One must commune with all those capable of communication, and regard logicity as well as knowledge as continuously distributed and growing within a community rather than the possession of solitary people. (This is Peirce's solution to the 'problem of the criterion' raised by traditional skepticism – see CP 5.327; W2: 247). In short, it is impossible for one's knowledge to grow unless the knowledge of others in the community is growing in concert. The logicity of committing to this growth of communal knowledge is the logical virtue of Charity.

Furthermore, no one could reasonably place confidence in any single arbitrary community of actual knowers, for that would be equivalent to trusting just one other random person, or just oneself. Therefore, the only remaining option is to place one's confidence in an idealized community of all possible inquirers of which oneself and one's local community is but a part. Going further, it is insufficient to think that knowledge is growing just because one's local community is regarding itself as part of this indefinite community; whether knowledge is really growing depends on how well this indefinite community would be able to receive communication of, and then confirm, your local community's inferences. That is to say, not only must your local community view itself within this indefinite community of inquirers, but it must prioritize what that indefinite community would confirm, committing itself to the principle that only this indefinite community's broader judgment validates local logicity. One must regard one's own logicity to be intrinsically involved with communing together with all those inquirers similarly capable of communing with this indefinite community. The logicity of committing to this indefinite community is the logical virtue of Faith.

Finally, because only that indefinite community's judgments could validate local logicity now, each inquirer must not take that community to be merely hypothetical as an imagined conception, but as potentially real for an indefinite amount of time into the future. Only that indefinite community's ultimate knowledge would be able to approximate the actual reality of the cosmos and closely approach truth. One's logicity at present does not really depend on whatever tiny sampling of reality and modestly designed methods of reasoning one's local community has been able to achieve, but whether the ultimate judg-

ment of that indefinite community would approve. One must regard one's own logicity to be intrinsically tied to what an actual community of ultimate inquirers would eventually determine. The logicity of committing to this ideal community surviving past any definite period of time is the logical virtue of Hope.

In short, people can regard themselves as reasonable and capable of knowing objective reality to any degree only if they first commit to the ideal of logicity itself, and then commit to the logical virtues of Charity, Faith, and Hope in that order, with respect to this indefinite community of inquirers. Peirce says a great deal about logicity, but he does not expand upon the three highest logical virtues, nor does he explain what communities of people satisfying these virtues specifically do to exemplify these virtues. Virtue in this context of 'social' logic probably means for Peirce something like an ethical habit, a deliberately adopted disposition regarding the promotion of communality. Peirce does cite ethics as a crucial aid to his reflections on communal logicity (CP 1.191; CP 1.576; CP 2.82; CP 2.198; CP 4.240; CP 5.35; CP 5.111; CP 5.533).

We can question the ethical habits of inquiry communities already using scientific methods (rather than tenacity, authority, or a priori methods). These communities are loyal to logicity in principle, not merely by pursuing its own scientific inquiries, but also by refusing to compromise with any non-scientific community. Scientific communities frequently encounter intellectual communities based on tenacity, authority, or a priori methods. For example, dialogue between science and religion (where tenacity and authority dominate) is fruitful when heightened understanding of science can result, but nothing about science should change in the process. Peirce envisioned a 'scientific' theology in "A Neglected Argument for the Reality of God" (CP 6.452–493) to induct religion into scientific inquiries. Science also encounters philosophical systems based on a priori methods. Intellectual communities self-satisfied with their own intuitive reasons make complaints about incompatibilities between their reasons and scientific methods or knowledge. Some a priori communities think they can intuitively or rationally know reality better than science, leading to transcendentalisms; others only maneuver for a relativistic situation where they can't be disproven by science, leading to dualisms. Again, loyalty to logicity demands that science refuses to be impressed by illusory a priori realities, and refuses to admit any limitations to its logical reach. Science's loyalties to naturalism over transcendentalism and scientism over dualism are demanded by the ethics of science.

After devotion to logicity itself, the three highest virtues for inquiry communities – Charity, Faith, and Hope – demand characteristic excellences. An inquiry community exemplifying the spirit of Charity will pay due respect and

consideration towards the knowledge of other inquiry communities, past and present. The precise methods used by different fields of science, for example, may not look much like each other, yet these fields are prepared to use each other's knowledge where relevant, and seek coherences where possible. The virtuous habit of Charity will be exemplified in Consilience – fields of science care about their coherences and convergences regardless of whether inquiry methods are identical.² Sometimes neighboring fields will converge in method and knowledge to the point of merger, but Charity does not demand widespread unification or reduction of many sciences to a few sciences or just one. Consilience does demand some sort of connected naturalism, in which logical and ontological relationships connect every science with at least one other science to link all sciences. This continuous perspectivalism finds a place for every science and yields a general survey across all known reality, so that reality “hangs together” without any absolute discontinuities or ontological dualisms. Aristotle's naturalism was an early vision of this consilient naturalism.

An inquiry community fulfilling the virtue of Charity may or may not also fulfill the virtue of Faith. Seeking consilience among communicative sciences is one thing. Conducting science with a view towards communing with an indefinitely enlarged community, with whom mutual communication and comparison may be impossible, is quite another matter. How can our science commune with any broader community of intelligent inquirers that may learn of our knowledge someday, long after human inquirers are extinct? To conduct inquiry with a view towards ensuring that any future inquirers could understand our knowledge and perhaps make some small use of it, is to conduct inquiry with an attitude of profound Faith. Faith makes different demands on inquiry communities than Charity. To make our science useful to any inquiry community later surveying what we have learned, the design of scientific methods must be carefully considered. To fulfill Charity, respect for scientific perspective is needed; to fulfill Faith, perspective in science becomes a problem. Science must control its terminology (CP 2.219–226) to avoid cultural parochialism and control its theoretical laws to ensure perpetual confirmability. (Consider the difficulties understanding Mayan or Babylonian scientific texts). From terms for measurement (compare ‘one yard’ with ‘one meter’) to theoretical terms (from ‘impetus’ to ‘inertia’), and on to the very conception of ‘laws’, ‘forces’ and ‘energies’ of nature along with ‘space’ and ‘time’ in themselves – they all must be stripped of intuitive local meaning or replaced by invented terms to become the skeletal framework for truly scientific logicity. Scientific terms must be defined in ways that any intelligence could decipher, and scientific laws must be sought which could be tested, and perhaps confirmed, by any intelligence anywhere in the universe. This is the Galileo-Einstein revolution in science: Relativity is the fulfillment

of the scientific virtue of Faith. Consilient naturalism and universal relativity are quite compatible (today's cosmology satisfies both, for example) so long as sciences can communicate with each other and commune with any future intelligence.

Finally, an inquiry community fulfilling both Charity and Faith has the opportunity to fulfill the virtue of Hope. We are almost powerless to influence the far future of all intelligence in the universe, but failing to try is the surrender of Hope. Devotion to Hope demands far more than the basic virtue of logicity. It is one thing to prevent science from compromising with other cultural forces in the pursuit of truth; it is quite another to instill science as the truly all-pervasive force in culture. To encourage not merely the survival of science, but to grow scientific culture (including scientific ethics and aesthetics) into the greatest guiding force for all humanity and anything that make evolve from humanity, is to promote Hope. To control civilization towards a thoroughly scientific future, to shape it as an exemplary model of reasonable civilization regardless of its own eventual extinction, is to fulfill Hope.

Reasoning is communal in method and spirit. Consilient naturalism, universal relativity, and reasonable civilization are the communal exemplifications of the three highest scientific virtues of Charity, Faith, and Hope. The virtuous growth of communal reasonableness, not coincidentally, meets Peirce's expectations about the *summum bonum* (CP 1.191) and the harmonious destiny of the cosmos.

Robert E. Innis¹

13 The Bottomless Lake of Consciousness

Every kind of consciousness enters into cognition. (CP 1.381, 1880).

In one of his most powerful images, Peirce described consciousness as a “bottomless lake”. Unlike James’s characterization of consciousness as a stream that flows, which Peirce did not reject but also did not foreground, Peirce had recourse to the schema of a lake, not with respect to its capacity to reflect what lies above it, in the luminous power of its surface, but with respect to its opaqueness. “I think of consciousness as a bottomless lake, whose waters seem transparent, yet into which we can clearly see but a little way. But in this water there are countless objects at different depths; and certain influences will give certain kinds of those objects an upward impulse which may be intense enough and continue long enough to bring them into the upper visible layer. After the impulse ceases they commence to sink downward” (CP 7.547). Such a governing image, or icon of mind, seems to be rather far from James’s dynamic image of the “free water of consciousness”, with its eddies and currents that flow around the stones that block its unencumbered passage and introduce into it systems of resistances and furtherances. The static image of a lake, with its defined and unmoving outer limits and implied placidity, stands in apparent sharp contrast with the forward rushing current of consciousness and its uneven and ever changing banks. At the same time, the “law of mental association” (EPI: 39) which provides influences and impulses for the upward movement of objects operates in time. The perceptual judgments that mark the eruption of objects on the ‘surface’ of consciousness, as Peirce remarked in his review of James’s *Principles*, are instances of inference, but they are not, and need not be, explicit. A perceptual judgment is “a judgment absolutely forced upon my acceptance and that by a process which I am utterly unable to control and consequently am unable to criticize” (CP 5.157). We are interrupted by the world, which appears as a kind of ‘rupture’ in the flow of consciousness, an encounter with secondness.

For neither Peirce nor James, however, is consciousness amorphous nor is it even clear just what it is, as a famous interchange between Peirce and James indicates. Peirce remarks that consciousness is “a very vague term” (EPI: 53). The vagueness in this case, for Peirce, is a sign of the essential openness of the notion of consciousness. But its vagueness does not prevent our demarcating groundlines in the experienced plenum. Both James and Peirce offer proposals for ‘triangulating’ the experienced space of consciousness. James, for his part,

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proposed, in his *Principles*, the well-known tripartite distinction of theme, field, and margin, distinctions which, looking forward, inform in the background and permeate Dewey's great work in aesthetics, *Art as Experience*, with its fertile appropriation and transformation of essential elements from both James and Peirce, especially Peirce's theory of 'quality' and James's notion of the openness of the spiral of experience itself, a field that grows at and by its edges. For James, these distinctions between theme, field, and margin are phenomenologically derived. They have in the *Principles* a descriptive function, without ontological or metaphysical implications, which appear more strikingly in his essays in *Radical Empiricism* and its formulation of a kind of monism of a world of 'pure experience.' Peirce, for his part, as is well known, combined the phenomenological, the ontological, and the semiotic in his approach to consciousness in particular and to cognition in general. Like James, he has a tripartite schema, but Peirce also relates his schema to a set of ultimate categories that apply not just to consciousness but to the fundamental architecture of the world. The ultimate categories of consciousness, feeling, reaction-sensation, thought, and the ultimate categories of the world, firstness, secondness, and thirdness, are isomorphic with his fundamental semiotic triad of iconicity, indexicality, and symbolicity.

Since every kind of consciousness enters into cognition, and consciousness has a metaphysical relevance or grounding, then the 'kinds' of consciousness for Peirce have a kind of ultimacy. But, one could ask, is it really necessary, or even possible, to define consciousness and cognition ontologically or in terms of a system of ultimate categories and, by extension, semiotically, since for Peirce all thought takes place as sign processes? This is the fateful question Peirce asks, and forces us to ask. But it also raises the question of whether the psychological, the phenomenological, the semiotic, and the ontological frames can be, indeed must be, systematically correlated in the way Peirce so desires and whether we are forced to interpret Peirce in his own terms and every other approach to consciousness and cognition in light of his schematization. Are Peirce's differentiations of the kinds of consciousness ultimate, rooted in his phaneroscopic observations? Are they sufficiently comprehensive, in a number of respects, to encompass the pluriform phenomenon of the bottomless lake of consciousness?²

Peirce's correlation of his ontological categories of firstness, secondness, and thirdness to the psychological categories of feelings, reaction-sensation, and thought and to the major division of signs into icons, indices, and symbols

² The following reflections are based on extended discussions to be found especially in Innis 1982, 1994, 2002, 2009. I have omitted even mentioning points of intersection between Peirce and such thinkers as John Dewey, Karl Bühler, and Michael Polanyi, all of whom are concerned with the themes and issues only sketched in this brief meditation.

gives the appearance of a kind of systematic co-dependency and mutual implication. For Peirce they were internally related, with, it seems, the ontological dimension holding primacy. But there is tension in Peirce's position. On the one hand, the three categories are "perpetually turning up at every point in every theory of logic, and in the most rounded systems they occur in connection with one another" (EPI: 296). As he wrote to Lady Welby in 1904 the doctrine of categories "long ago conquered me completely" (CP 8.328). On the other hand, Peirce claimed that the categories are the results of a "scientific and fundamental analysis of the constituents of consciousness" (CP 7.542). At the same time, however, this division of consciousness, while phenomenologically astute, is still a 'logical' division of the plenum of consciousness. In admitting that consciousness was "a very vague term", was Peirce really admitting the very protean nature of consciousness, something that kept him from identifying it with any one paradigmatic form or capturing it in a model that was superordinate to all others?

Peirce's triadic schema of the mental elements, and their semiotic embodiments, is, in fact, exceptionally fruitful. It pinpoints in a precise and open manner dimensions in which consciousness operates and defines the world and it explores the supports upon which it depends and is embodied. It sketches, in multiple registers, the 'sense-functions' or 'modes of access' both to 'the world' and to ourselves. Peirce has clearly shown that when we engage the flux of experience we become aware of a felt quality, encounter an interruption or resistance to a prior feeling, and bind the flux of experience into a unity, which has some form of generality upon which rational habits can be based. These three modes, which constitute cognitional structure for Peirce, are not phases. Peirce's model is not genetic. They are, he says, "constant ingredients of our knowledge" and are due to "congenital tendencies of the mind" or, in one sense, "three parts or faculties of the soul or modes of consciousness" (CP 1.374). As a result, Peirce affirms three categories of consciousness that inform cognitional acts and processes:

first, feeling, the consciousness that can be included with an instant of time, passive consciousness of quality, without recognition or analysis; second, consciousness of an interruption into the field of consciousness, sense of resistance, of an external fact, of another something; third, synthetic consciousness, binding time together, sense of learning, thought. (CP 1.377).

Peirce's claim is that the three categories and the three modes are comprehensive and exclusive, characterizing indubitably "three radically different elements of consciousness, these and no more" (CP 1.382).

Now, it is precisely this claim to comprehensiveness and exclusivity that gives rise to some critical hesitation, despite the heuristic fertility and systematic power of Peirce's own analyses. While I myself accept the revolutionary importance of the semiotic turn in philosophy, to which Peirce made essential contributions, is it possible to doubt whether Peirce's account of consciousness, wedded as it is to his ontology, has sovereign descriptive advantage, in every case, over some alternative attempts to segment and relate the dynamic as well as the structural currents of consciousness? The questions we face are whether (a) it is necessary to absorb other schemas into the Peircean schema, assuming its ultimacy, or (b) relate the Peircean schemas to others in a kind of 'rotation.' If consciousness is indeed a bottomless lake, it would appear that as a plenum it would submit to multiple divisions that are not in opposition but are rather complementary. Consciousness as a vortex of processes and events in which the world is appropriated can be described and accessed on multiple levels and with quite different 'orthogonal projections.' Just as we can map the earth in multiple projections or equivalent modes, each revealing and highlighting features that are minimized or even suppressed in others, so perhaps we are confronted with the dialogical, or dialectical, task of translating between maps and trying to determine their relative strengths and scope.

James' theme-field-margin schema clearly captures a central feature of how significant unities emerge in the flux of consciousness, including those unities we call 'signs.' The very recognition of something as a sign exemplifies the theme-field-margin schema. I am not sure we need to choose between Peirce's schema and James's or assimilate one to the other. They are meant to foreground different features of consciousness. Even if we accept, as we should, Peirce's thesis about semiotic closure, that "man is a sign", that "all thought takes place in signs", and that as a consequence there is no 'outside' to the play of signs, we can see that sign-actions, as actions of consciousness, in their different functions and types, are oriented toward and constitute various systems of thematic foci, stabilizing and realizing them by cutting the experiential flow. But no sign or sign-system *as a totality* is free-standing and independent. It is located not just within a formal semiotic field marked by differences that make a difference but within a dynamic experiential field, subject to currents beyond the full control of the sign-user or semiotic subject, as Peirce indicated by his use of the bottomless lake image. And as James makes clear in his discussion of finite provinces of meaning, there are multiple fields in which one is operating, and they are essential determinants of the forms or frames of attending. James allows us to foreground the experiential dimension of semiosis and to follow up the various ways our embodiment in sign-systems both enable and constrain the stream of consciousness with its swirling currents or the subterranean forces acting in Peirce's bottomless lake. Moreover, the Jamesian margin, aura, or

halo that surrounds not just perceptual objects but all signs and their objects point to the phenomenon of the essential openness of experienced meaning and the role of resonances in our pluriform processes of meaning making, our sense of a fringe of relations that always eludes our full grasp. James's triad, based first and foremost on our apprehension of perceptual objects, can in this way be extended to the general processes of semiosis. Conversely, inasmuch as 'objects' for Peirce have differently weighted iconic, indexical, and symbolic dimensions even on the perceptual level, the Jamesian phenomenologically defined theme is a semiotically defined theme. As a result, both objects and signs can be analyzed according to the theme-field-margin schema, which is a permanent structural feature of consciousness.

And what are we to make of Ernst Cassirer's magnificent trilogy on the philosophy of symbolic forms, which operates with a different triadic schematization of the sense-functions of consciousness? Cassirer distinguishes between, and uses as his fundamental division of the plenum of consciousness, 'expression,' 'representation,' and 'pure signification' (*Ausdruck, Darstellung, Bedeutung*). Cassirer rightly claims that the "concept of consciousness seems to be the very Proteus of Philosophy" (1929: 48), one main task of which is to uncover the "original attitudes and formative modes of consciousness" and to resolve "the question of the structure of the perceptive, intuitive and cognitive consciousness" (1929: 448), which he calls a "spiritual triad" (1929: 101). Out of these structures arises what Cassirer called "three form worlds" (1929: 448). Peirce's semiotic triad of iconicity, indexicality, and symbolicality, however, operates in each one of these formative modes of consciousness and their paradigmatic exemplifications in myth, language, and mathematical sciences. But Cassirer does not use Peirce's 'logical' criterion to distinguish the sense-functions of consciousness based on the relation of a sign to its object: resemblance, existential connection, convention. While there are clearly deep connections between Peirce's and Cassirer's schema, Cassirer's fundamental criterion is the ability to 'distance' the sign from its object. In expression we have access to a "vast diversity of original physiognomic characters" (1929: 68), a "physiognomic individuality" (1929: 69) that gives us the "original face" of objects, where "showing equals meaning" (1929: 72), a clear parallel to the iconic dimension. Mythic consciousness and art work primarily in this way. Language introduces, in its representational function, a distance between what it means and the carriers in which linguistic meaning is embodied. But it still needs an 'intuitive' support and is wedded to the perceived world. The turn to pure signification involves a sign-object relation that transcends imaginative as well as perceptual supports. The sign systems function in their own terms, purely formally, the prime example being theoretical physics and mathematics, although they bear upon the perceived world, whose abstract relations they capture and formulate. There are clearly advantages to

such a schematization, which I see as complementary to Peirce's. Cassirer's schema leads to deep exploration of myth, art, language, religion, and the mathematical sciences that are full of insights. In this sense Cassirer did not develop just a prolegomenon to a semiotic philosophy of culture. He developed, at least in outline, that philosophy itself. Should we not try to integrate his analytical insights, if not his substantive conclusions, into a Peircean frame or should we do the opposite? Or what? The issues are not merely methodological but also substantive. Is it necessary to see Peirce's semiotic pragmatism and Cassirer's philosophy of symbolic forms as competitors?

The bottomless lake of consciousness is the 'place' of minding and meaning-making. The impulses and influences gestured at by Peirce make up a great matrix of transitions into felt feeling, with their autogenic and exogenic points of origin. For Susanne Langer, as for Peirce, we are in the lake rather than the lake being in us. We, too, emerge out of the lake, the substrate of which, for Langer, is the great process of *natura naturans*, marked by transitions and emergent forms. But what emerges out of us, as we emerge out of nature, are the results of processes of symbolic transformation, the emergence of novel ways of giving form to the world through the burning fountain of thought signs that we are. Langer has argued that symbolic transformation, the defining mark of *animal symbolicum* and her term for semiosis, runs in two major channels, the discursive and the presentational, each with its own 'logic.' Langer divides the semiotic continuum in such a way in order to avoid the great temptation of logocentrism and the temptations of the intellectual lockjaw of epistemology that John Dewey so feared. Her analysis of the semiotic continuum, which is consciously indwelt, does not contravene Peirce's semiotic distinctions, which she can clearly reconstitute. Her analysis of language, rooted in the work of Phiipp Wegener, Alan Gardiner, and Karl Bühler, and her magnificent analyses of the great forms of feeling presented in art, which not only transforms and extends Cassirer's great project, allow her to explore the symbolic and the iconic dimensions in rich ways. And with her reliance on key concepts of Gestalt psychology, she is able to place reveal new aspects of indexicality. But her sober metaphysics, devoid of the triadic schema of ontological categories, makes us wonder just how unified the various contexts of the analysis of consciousness can or must be and whether we need an ontological ground to help us find our way around in the bottomless lake of consciousness.³

But is not such a perplexed wonder to be expected if consciousness is a bottomless lake?

³ I discuss in detail the relations between Peirce and Langer in my "Peirce's Categories and Langer's Aesthetics: On Dividing the Semiotic Continuum", *Cognitio* 14 (2013).

Kalevi Kull¹

14 Physical Laws are not Habits, while Rules of Life are

It may fairly be urged that since the phenomena of habit may thus result from a purely mechanical arrangement, it is unnecessary to suppose that habit-taking is a primordial principle of the universe. (CP 6.262, 1882).

This thought of Peirce from his article “Man’s glassy essence” (Peirce 1892) perfectly corresponds to advanced scientific understanding more than a century later. The main point of the following argument, however, is to fix Peirce’s error concerning his interpretation of physical laws, in order to understand more clearly what are the limits and power of semiotics (and what does not need to be semiotics). This may carry forward the work by Rulon Wells (1980), who pointed out Peirce’s error of not distinguishing between laws and rules.²

As Colapietro (1989: xvi) has said “It is all too easy for those who have studied intensively the writings of Peirce to get so caught up in his “system” that they come to see it as a place in which to dwell rather than a point from which to proceed”. In “Man’s glassy essence”, Peirce also stated:

But what is to be said of the property of feeling? . . . The slime is nothing but a chemical compound. There is no inherent impossibility in its being formed synthetically in the laboratory, out of its chemical elements; and if it were so made, it would present all the characters of natural protoplasm. No doubt, then, it would feel. To hesitate to admit this would be puerile and ultra-puerile. By what element of the molecular arrangement, then, would that feeling be caused? This question cannot be evaded or pooh poohed. Protoplasm certainly does feel; and unless we are to accept a weak dualism, the property must be shown to arise from some peculiarity of the mechanical system. Yet the attempt to deduce it from the three laws of mechanics, applied to never so ingenious a mechanical contrivance, would obviously be futile. It can never be explained, unless we admit that physical events are but degraded or undeveloped forms of psychical events. (CP 6.264).

It would be worthwhile, particularly for biosemioticians, to pay attention to this quote. What he states here is very well argued and acceptable – except the very last sentence: “It can never be explained, unless we admit that physical events are but degraded or undeveloped forms of psychical events”. Here Peirce makes a logical flaw.

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² On this topic, see also Pape 1984.

First, it would require a proof to demonstrate that there cannot be such boundary conditions and initial states with these laws that can infer the feeling protoplasm. Peirce does not have this. And second, if something is not deducible from deterministic mechanical laws, it does not yet imply that it is not explainable, without such deduction. For instance, arbitrary relations are by definition the relations that are not deducible from deterministic laws. If a sign relation assumes arbitrariness, then it is not deducible from deterministic mechanical laws; at the same time it should not contradict these laws. (There is much in the world that is not deducible from physical laws, being at the same time in conformity with these laws. For instance, boundary conditions are not deducible from physical laws).³ From the existence of phenomena that are not deducible from physical laws it *does not follow* that physical laws have to be reinterpreted. Peirce's mistake is that he assumes that physical laws should be reinterpreted in order to explain mind. (The century that has passed after Peirce, has provided many results – for instance, the recent T. Deacon's work, preceded by J. v. Neumann, I. Prigogine, R. Rosen, H. Pattee, and much of recent biosemiotics – that make it possible to obtain an alternative, a “non-Peircean” solution in this case).

The only way to interpret Peirce's last sentence positively is by taking the words “degraded” and “undeveloped” not evolutionarily, but metaphorically. Analogically, we may claim a formal language is a special case, or “degraded”, or “undeveloped” form of the natural language. Accordingly Peirce's statement about the physical laws looks correct on the level of description of these laws, not on the level of these laws themselves.

Peirce deduced from synechism a possibility to swerve from the perfect physical laws. He also thought that mechanical explanation of evolution is impossible. However, this is not the view of the contemporary physics or biophysics. Since correctly formulated physical laws are by definition only those which perfectly hold (and even if they change, then these are physical laws only if there is another exact physical law about this change), the problem simply transfers into the question whether sign relations are deducible from the physical laws. If semiosis is in accordance with physical laws, but not deducible from these, this will give semiotics power to be the basis for all sciences that deal with sign relations. While physics is the science that explains on the basis of physical laws (literally, that studies things and interactions), then semiotics is the study of all forms of knowing and meaning-making.

It so happens that there exists a nice solution for Peirce's error. I am going to argue that if we interpret habit-taking as exclusively a feature of living or life-

³ Pattee, Kull 2009: 318.

produced systems, then it will be in conformity with contemporary biosemiotics and biological knowledge altogether.⁴

Peirce on physics

Let us pay attention to how Peirce's views on physics are related to his concept of semiotics. What Peirce thought about physical laws:

These laws have had a very wonderful effect upon physical sciences, because they have shown the very high degree of exactitude with which nature acts – at least, in simple configurations. But, as I said before, the logic of the case affords us not one scintilla of reason to think that this exactitude is perfect. (CP 1.155).

The question is whether particles may not spontaneously swerve by a very little – less than we can perceive – from the exact requirements of the laws of mechanics. We cannot possibly have a right to deny this. For such a denial would be a claim to absolute exactitude of knowledge. On the other hand, we never can have any right to suppose that any observed phenomenon is simply a sporadic spontaneous irregularity. For the only justification we can have for supposing anything we don't see is that it would explain how an observed fact could result from the ordinary course of things. Now to suppose a thing sporadic, spontaneous, irregular, is to suppose it departs from the ordinary course of things. That is blocking the road of inquiry; it is supposing the thing inexplicable, when a supposition can only be justified by its affording an explanation. (CP 1.156).

There is not a clear distinction here between the law as a description and the law as what is described. The *absolute exactitude of knowledge* concerns the former, but not the latter.

Let me ask you a little question? Can the operation of *law* create diversity where there was no diversity before? Obviously not; under given circumstances mechanical law prescribes *one* determinate result. (CP 1.161).

As the 20th century physics has demonstrated, the latter is not true. There are strict physical laws, which allow several different results under given circum-

⁴ Frederik Stjernfelt, in his letter to Biosemiotics list from March 30, 2013, has asserted: “Panpsychists may, it is true, find ammunition for their ideas in Peirce. But it is important to realize that anti-panpsychist quotes may be found in Peirce as well. Often, he discusses Thirdness without assuming that all Thirdness is mental, psychical or semiotic – where Thirdness refers to there being lawlike, general structures in reality. A prime example of such structures is gravity. This, of course, is his “scholastic realism”. But is gravity, in itself, in some sense mental or semiotic? Are all triadic relations signs? Oftentimes, he does indeed draw such conclusions – especially in the crisis years around 1892 (e.g. “The law of mind”). But other times, he does not”.

stances. The instances are the laws of spontaneous radioactive decay, and the other non-deterministic processes based on fundamentally probabilistic laws (biological and cultural diversification is yet of different kind). Peirce, however, said,

I could easily prove this by the principles of analytical mechanics. But that is needless. You can see for yourselves that law prescribes like results under like circumstances. That is what the word *law* implies. So then, all this exuberant diversity of nature cannot be the result of law. Now what is spontaneity? It is the character of not resulting by law from something antecedent. Thus, the universe is *not* a mere mechanical result of the operation of blind law. The most obvious of all its characters cannot be so explained. It is the multitudinous facts of all experience that show us this; but that which has opened our eyes to these facts is the principle of fallibilism. (CP 1.162).

The principle of continuity is the idea of fallibilism objectified. For fallibilism is the doctrine that our knowledge is never absolute but always swims, as it were, in a continuum of uncertainty and of indeterminacy. Now the doctrine of continuity is that *all things* so swim in continua. (CP 1.171).

This is the heart of Peirce's cosmology – his “*synechism*, or the doctrine that all that exists is continuous” (CP 1.172).

CP 1.174 demonstrates the view of Peirce that physical law can never explain diversification. No doubt that the physical explanation of diversification has been difficult to achieve, but at least after the work of Prigogine and Thom we cannot agree with this statement of Peirce any more. At least the diversification in cosmological evolution is physically explainable. When speaking about the law of the conservation of energy, Peirce admits:

We can from the nature of things have no evidence at all tending to show that these laws are absolutely exact. But in some single cases we can see that the approximation to exactitude is quite wonderful. (CP 1.155).

He also says:

Can we, then, ever be sure that anything in the real world is continuous? Of course, I am not asking for an absolute certainty; but can we ever say that it is so with any ordinary degree of security? (CP 1.167).

(and also CP 1.169: “Here, then, it seems to me, we have positive and tremendously strong reason for believing that time really is continuous”).

Thus, Peirce somehow agrees that the doctrine of continuity is a hypothesis, since we cannot have a direct evidence about it that would be absolutely certain. However, “the doctrine of continuity rests upon observed fact as we have seen” (CP 1.172).

The latter statement is particularly interesting, because it is clear that there is no way to demonstrate the world's continuity on the basis of facts. However, if the world is continuous, then indeed we may believe that each evidence also says something about what is there close to (in the vicinity of) it.

Thus, once we do not agree here with Peirce, can we see where he makes a logical error? This would be a big project to deconstruct the reasoning of Peirce on these issues in a framework that would allow us to make it clear. I cannot do it here. However, here are some hints.

I think that we have one positive direct evidence of continuity and on the first line but one. It is this. We are immediately aware only of our present feelings – not of the future, nor of the past. (CP 1.167).

So, Peirce assumes that “We are immediately aware only of our present feelings”. This statement may not be correct. Because what we are immediately aware of, is already past. Awareness presents us what has already been. Interestingly, this is true for both conscious perception and voluntary action.⁵ Thus the present as what is felt now is just a tautological definition.

Peirce, indeed, sees that “we can reach no conclusion from the present but only from the past” (CP 1.167). But, still, he assumes that we are immediately aware only of our present feelings. Therefore, he has to ask: “How do we know then on the whole that the past ever existed, that the future ever will exist?” (CP 1.168). He finds an answer via his doctrine of continuity. Peirce's view on the present is quite interesting:

We may then say that one portion of mind acts upon another, because it is in a measure immediately present to that other; just as we suppose that the infinitesimally past is in a measure present. And in like manner we may suppose that one portion of matter acts upon another because it is in a measure in the same place. (CP 1.170).

According to Peirce, interestingly enough, the continuity, once accepted, cannot be broken. This is like physical laws (not as descriptions, but as the ones that are thought to be described) are errorless, according to the basic assumption of the contemporary physics.

However, if we cannot accept that we are immediately aware only of our present feelings, and instead assume that the present is a construction we make, and the awareness is a certain description about the things some time ago, then this central argument of Peirce fails. Thus my point is that Peirce's

⁵ It is appropriate to recall the experiments by B. Libet (see Libet 2004).

error is (at least partly) rooted in his slightly simplistic concept of awareness (cf. Libet 2004; Soon et al. 2008).

Of course, the other source for Peirce's position is in his inability to see how diversification can be possible on the basis of mechanical laws. He, indeed, could not see it, because it indeed required much work in physics until the origin of order, as it occurs in living systems, could be explained – via the results of synergetics, the theory of self-organization, thermodynamics of open systems, and complex systems theory – at least.

Peircean biosemiotics

Stating that Peirce at certain points made this fundamental error of universalizing fallibilism, or more precisely, used an assumption that, if very efficient and productive was, however, not a necessary one, and was even misleading in some instances, I still do not think that his semiotics fails. Not at all. What we come to see here is simply the limits of his semiotics, as well as semiotics in general. Fallibilism is a necessary assumption for all levels of learning, beginning with the adaptation by a living cell.

Semiotics is about things that evolve, about diversification – this is a view to share with Peirce. However, this requires that we understand the fundamental difference between the diversification like speciation in living (communicating) systems, and the orderliness that occurs as a result of cooling, like crystallization or the formation of planets. Diversification in the Peircean sense corresponds to the first and not to the latter. What happens with matter when temperature goes down can be calculated and thus predicted on the basis of physical laws. The diversification of organisms where learning (and thus meaning-making) is involved is a very different process; its results are not deducible from physical laws (otherwise it could not be knowing of any kind). While physics is about laws, semiotics is about rules (these rules include relations, and codes). But we know about the existence of particular laws only via particular rules.

The possibility of getting different products from the same initial state – the dynamics that is claimed to be not achievable by physical (mechanical) laws – is achievable, if the equality of states is categorical and not mechanical. This means that a vast number of mechanically different states are recognized as one and the same, and these macroscopic identities are taken as the basis for further decisions of behaviour. This is the case in recognition-action systems with memory – which are living systems. Life is an agent that sustains and establishes relations.

With the introduction of the concept of the lower semiotic threshold, some problems of its correspondence to Peirce's approach appear.⁶ For Peirce, semiosis starts from the situation of lawless chaos; laws then develop as habits. Thus Peirce does not accept universal laws in the sense that modern physics does – since the latter assumes something which in principle (by definition) can never err. The universal physical laws (like the conservation of energy and the conservation of momentum) are described in contemporary physics as certain fundamental symmetries (according to Noether's theorem) that are strict and unavoidable conditions for all processes. These symmetries determine what may happen. Within the framework of these symmetries, certain regions (combinations of processes) exist, which result on the one hand in autocatalytic feedback, and on the other hand in stochastic indeterminacy, an example of which is a dissipative system. Certain situations in these (quite chaotic) systems can be seen as corresponding to the Peircean assumptions of the primary appearance of habits, or rules of mind, or semiosis. These are the conditions where relations⁷ may appear. A relation is anything that cannot by itself affect, neither be directly recognized by, anything except another relational system. This is exactly what is true for a meaning – meaning exists only for other meanings, or a sign only for other signs. Or, as Jakob von Uexküll once (slightly sarcastically) remarked:⁸ those who cannot see the meanings seemingly lack the appropriate organ ... Or, with another formulation: a sign is anything that requires for its detection a living device; whereas in order to recognize it *as a sign*, to recognize a relation as a relation, no less than a semiotic animal⁹ (= a human) is needed.

The pre-biological indeterminacy of dissipative and chaotic systems (the Firstness) is the condition for dyadic relations (Secondness), whereas only with triadic relations (with Thirdness) life, the plural world,¹⁰ starts. Since then there exist true signs, the semiosis, and since then the different types of signs can evolve. F. Kruse's (1991) analysis says,

Is the Peircean universe “composed exclusively of signs”, as he hints in one of his later writings (1906: 5.448 n.1)? In light of our examination of the later theory of categories, it is clear that the answer to this question must be “No”. The universe is composed exclusively of things, events, and phenomena that have the capacity to become signs in some respect or another, but only a very few of these (namely, dynamic logical interpretants) are intrinsically interpretive. Furthermore, among the elements in nature are those (such as dynamical objects) that condition and resist semiosis, and insofar as they do so, they cannot be signs.

6 This and the next paragraph repeat the material from Kull 2009.

7 See a review on the concept of relation in Bains (2006).

8 Uexküll used the word *Bedeutungsblind* (Uexküll 1982[1940]).

9 In the sense of Deely et al. (2005).

10 On semiosis as the process that makes the world locally plural, see Kull (2007).

Consequently, Peircean semiotics works very well in the realm of life and life-produced rules.

Concluding, let me remark that the same Peircean error has been noticed and analyzed by several scholars, among them Rulon Wells, who says (Wells 1980: 198):

“... there is formal but not material categorial identity between rules and laws. Thirdness itself is only a formal category. Described in Peirce’s own terms, Peirce’s mistake is to move from formal to material categorial identity. The temperamental penchant that leads him to this mistake is, to give it his name for it, idealism.¹¹

Physics is about laws; semiotics is about rules. Habits belong to rules, since they are potentially fallible, which is different from physical laws. One cannot simply miss the hard step from physics to semiotics, the radical emergence (Kauffman 2012) of teleodynamics from morphodynamics (Deacon 2011). Charles S. Peirce is a wonderful classic of general semiotics, which is “intended to be a *foundational* theory [... for] ‘the semiotical sciences’, [... which study meaning-making processes from] ‘artificial intelligence’, on the one hand, and to the behavior of very primitive forms of life, on the other” (Ransdell 1977: 159).

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¹¹ Indeed, Peirce himself observes this: “My philosophy resuscitates Hegel, though in a strange costume” (CP 1.42).

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15 Semiosis: from Taxonomy to Process

Symbols grow. They come into being by development out of other signs (CP 2.302, 1885).

Introduction: from taxonomy to process

During the course of his writings, Charles Sanders Peirce developed and modified a series of sign taxonomies of increasing complexity. In addition, these taxonomic categories were all constructed hierarchically using his three general categories of relations: Firstness, Secondness, and Thirdness. For the most part Peirce and his many contemporary interpreters have treated these as synchronic categories or sign types. But Peirce was also one of the first *process* philosophers, and his conception of sign interpretation was that a sign only exists by virtue of the way it is some way is completed by another sign; its interpretant.

In contrast to the common tendency to interpret Peirce's sign types synchronically and independently, I propose to understand these hierarchical taxonomies as describing the constraints imposed on any constructive semiotic process by which more complex sign relations grow and emerge from more basic sign relations. Seen from this perspective, these taxonomic hierarchies describe the cognitive stages of sign interpretation, both as a synthetic and an analytic process. The transitions from lower to higher stages can in this way be seen as exemplifying what Peirce termed "hypostatic abstraction" and which following Bertrand Russell became understood as logical type differences. Although this may be seen as an almost heretical departure from contemporary Peircean scholarship, I believe that it is the only viable path toward a semiotic cognitive science, and one that I believe Peirce would have approved of.

A semiotic cognitive science?

We think only in signs. (CP 2.302).

For Peirce, there should not be a different set of concepts used for studying minds and studying communication. Cognition *is* semiosis.

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Currently, however, cognitive science is largely a non-semiotic science and is largely characterized by a computational model of information processing. In a computational framework any inferential process that can be completely described in terms of the manipulation of sign-tokens can be instantiated by the operations of a machine, which can substitute for the corresponding human mental effort to manipulate these tokens or their equivalents. All that is required is an appropriate mapping between the two behaviors that preserves sufficient isomorphism. Contra behaviorism, complex algorithms can be interpolated between inputs and outputs and are thus taken to constitute mind, in this standard paradigm. But like behaviorism, even this computational approach to mental representation (“aboutness”) requires an externally imposed arbitrary mapping function on “syntactic processing” in order to define mental representation. Worse yet, dynamical systems approaches to cognition are largely antagonistic to any theory of mental representation and instead invoke merely mechanistic notions, such as “structural coupling” of brain states with environmental states.

A significant challenge for these approaches that makes them incompatible with semiotic descriptions is that current computational and dynamical approaches assume simple physical objects (material or energetic) to be the building blocks of mind. In contrast, semiotic properties are not intrinsic to states, objects, or other sign vehicles (representamina, in Peirce’s terminology). They are relational and emerge in a process: interpretation. Anything can be taken as a sign for anything else in any respect (e.g. either icon, index or symbol) so long as an appropriate interpretant process is generated. Neither the intended interpretation of a produced sign nor any intrinsic properties of a given representamen determine its semiotic function. These features can at best constrain and bias interpretation, though it is often predictable from knowing the interpretive competence of an interpreter.

Consider the way scientific research transforms physical phenomena into sign vehicles. The example of cosmic microwave radiation is typical. In 1965 at Bell Labs while tuning a highly sensitive microwave antenna, Penzias and Wilson aimed it upward to calibrate it without a signal. To their frustration they couldn’t seem to eliminate a constant uniform microwave “noise” irrespective of where the antenna was pointed. Though initially they worried that the noise originated from the device itself, by a process of elimination they eventually concluded that it wasn’t internal noise but microwave radiation emanating from the cosmic background. Eventually it was interpreted to be the immensely red-shifted heat from the Big Bang. A phenomenon that had been present since the beginning of the universe only became a sign – an index – once the technological and theoretical interpretive apparatus was available. It took months

of theorizing to reach consensus on what it represented. In this process this representamen was progressively updated in its interpretation numerous times.

This scientific and technical semiotic history is paralleled by the second-by-second development of sign relations that occurs incessantly in an individual person's mental activities. Indeed, it is almost never the case that interpretation involves just one sign. Though it has become commonplace to identify the units of communication and the objects of art as signs of a given type, this is an abstraction away from the reality. There is nothing intrinsic to any object or token that determines its sign quality. Semiosis is a developmental process, and the sign types that we have labeled in our various taxonomies are not synchronic states, but transient phases in a process of interpretation. For this reason, we need a theory of semiosis that explains how signs develop from other signs in the process of their interpretation.

Semiotic classification must ultimately be regulated by a theory of the generation of semiotic relationships in which the homunculus of an interpreter is replaced by a process analysis. The necessity of this approach is implicit in Peirce's introduction of the concept of an interpretant, his conception of a person or mind in purely semiotic terms, and his willingness to consider non-human and non-mental processes as semiotic. It is my belief that cognitive science must eventually be subsumed under a much more extensive semiotic science that ultimately derives from a semiotic biology and neuroscience.

Interpretation cannot be explained by attributing it to a "mind" that is in some sense outside the semiotic process. As Peirce recognized, all thought is in signs. And signs in the mind are no more intrinsically referential than are letters on a page. So the meaning of a sign – a concept – is not in the head. It is, as Peirce often pointed out, something virtual, something intrinsically incomplete. Signs are qualities, objects, events, etc. which are not in themselves intrinsically significant, but are only significant in relationship in a process of interpretation. This is because signs must be interpreted via the production of other signs. But semiosis is nonetheless a physical process, and the production of an interpretant sign is a physical event marking a phase in a process.

Even though Peirce remarked that human thought often takes form in linguistic symbols, language is a special case of semiosis not the archtypical model. Thought is therefore not merely linguistic. Language is derived from and is dependent on more basic semiotic processes. Thus the evolution of language, as a special highly developed form of semiosis, also requires that we articulate a theory of sign development that incorporates the possibility that new forms of semiosis can emerge from prior simpler forms.

Because he envisioned signs as phases in a process, Peirce constructed his sign taxonomies componentially and hierarchically. As is well-known, Peirce

identifies three component aspects that determine a given sign relationship: the sign vehicle or “representamen”, the relationship of the representamen to its object of reference, and the relationship of these to an interpretant sign that follows in time. These are often described by the short-hand terms sign, object, and interpretant.² These are organized in relation to one another according to Peirce’s highly abstract general categories of relationship: Firstness, Secondness, and Thirdness, respectively. Moreover, he identifies First, Second, and Third forms of each. This categorical architectonic is the basis for his early three-by-three taxonomic matrix of sign features that is depicted in the lower right of Figure 1, and from which he derives ten trichotomies of sign forms (linked by arrows in Figure 1).

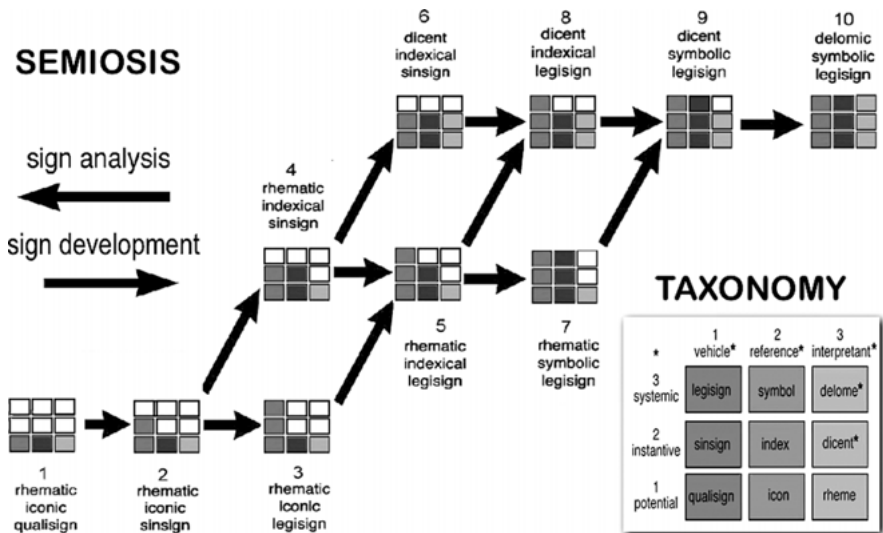


Figure 1: Semiosis and taxonomy

The hierarchic organization of these sign components is based on his three general categories of relation. This categorical architectonic is effectively a “subsumption hierarchy” in which higher-order types are dependent on lower-order types. This is because Thirdness (habit, regularity, generality, law) assumes relations among instances of Secondness (immediacy, singularity, contiguity, otherness), and Secondness assumes a relation between simple relata (qualities, properties, possibilities, etc.). So Thirdness is defined in terms of Secondness

² Even though this terminology risks treating these relational aspects each as independent relata this short-hand designation will be used throughout for simplicity.

and Firstness, whereas Secondness is defined in terms of Firstness only. The matrix of nine sign aspects is constructed with respect to this hierarchy applied recursively at two levels: first with respect to sign (1), object (2), and interpretant (3), and then with respect to how each of these component aspects exhibits properties that are either First (e.g. Qualisign, Icon, Rheme), Second (e.g. Sinsign, Index, Dicent), or Third (e.g. Legisign, Symbol, Delome), respectively. Following this subsumption logic this also means that, for example, a Legisign assumes the prior presence of a Sinsign, which assumes the prior presence of a Qualisign, and that a Symbol assumes the prior presence of an Index, which assumes the prior presence of an Icon, and so forth. Though exactly how this dependency is realized may not be obvious by superficial inspection, this follows naturally when we take a process perspective.

In order to use this taxonomic matrix to construct his 10 sign types Peirce argues that an additional constraint must be applied. This also follows from the dependency relation just described and how this plays out in the process of sign development, moment to moment in thought. Each specific type of sign relationship is constituted by a combination of sign type, object type, and interpretant type. But the relationship between these component features constituting a sign of a given form is limited so that no component feature of a higher order in the sign-object-interpretant series can be of a higher categorical type than a component feature of a lower order in the sign-object-interpretant series. Thus, the hierarchic level of the interpretant must be of a lower order than that of the object reference, which must be of a lower order than that of the representamen form. According to this restriction, for example, a qualisign cannot be the representamen for an indexical relationship and a sinsign cannot be the representamen for a symbolic relationship. Similarly, there can be no dicent icons or delomic indices. This can be rephrased in terms of a sign-sign relationship, since the interpretant is another sign produced to determine the semiotic function of a prior representamen. Thus if the sign is an index then its interpretant sign cannot be a symbol, but must be either an index or icon, and if the sign is an icon its interpretant sign cannot be a symbol or index, but must also be an icon. But why?

Again, this is where a process analysis is helpful. Consider that the interpretant is a sign generated in the process of interpreting a given representamen. It is what endows that representamen with its specific semiotic features. This makes the process retrospective in an important sense. Although the presence of a representamen precedes the generation of its interpretant in time, the semiotic function of this representamen is assigned by this process of interpretant generation. In this respect the semiotic function of a given representamen only comes into existence after the process of interpretant generation is com-

pleted. Although superficially it might appear that the interpretant necessarily follows the sign in time, this makes the mistake of assuming that a given representamen is already a sign before it is interpreted. To see the logical necessity of this restriction consider a few examples.

Consider how a naïve traveler might interpret a fluttering windsock seen for the first time at an airport through a window. Having no prior experience with such signs, what interpretive steps are necessary in order to recognize that it *indicates* the strength and direction of the wind? This competence will depend on the interpreter having the experience of watching fabric or similar materials (e.g. clothing, umbrellas, palm trees, sails, etc.) tending to hang or stand vertically except when being pushed horizontally by some force. It will also depend on experiences like these occurring in the context of feeling blowing wind, and having previously formed the notion that this force is being provided by wind. These remembered experiences are icons and the common presence of wind in each case is a higher order iconism that is brought to mind as these are juxtaposed in memory. This higher order iconism is the interpretant that must be generated in order to infer that the windsock representamen indicates something not currently experienced: the strength and direction of wind. Without recognizing an initial iconism between the windsock and these remembered experiences, and without recognizing the additional iconism between these remembered experiences, there can be no such inference and no indexical interpretation.

In addition, because of this discovered indexicality the distinctive tubular form of the cloth-like material and its placement on a pole so that it can freely rotate can now be given an additional interpretation. Whereas the initial recognition of an indexical function is merely a sinsign – a unique instance – these other features of the representamen can be seen as non-incidental to this semiotic function. The windsock might therefore also be recognized as a conventional device designed specifically for this indicative purpose. Its distinctive form and its presence in a context where wind strength and direction might have special relevance can now further contribute to interpreting the windsock as a conventional type of sign (a legisign) rather than as merely an accidental one-of-a-kind occasion that provides this information (a sinsign).

So the transition from one interpretive phase to the next higher phase is made possible by the generation of lower-order signs along with their relationships to one another. The interpretant is therefore not a more developed sign but rather the production of a sign that brings a more developed sign into existence. This logic is what gives rise to the hierarchic order indicated by the arrows in Figure 1. The recognition of any given sign form requires the production of an interpretant sign relation at the level just below, and so forth all the way down. Thus, every sign is the result of a developmental progression beginning from a

rhematic iconic qualisign through a series of phases of increasing semiotic complexity until the process stops because of its sufficiency for a given pragmatic end. Moreover, having been developed to a given level, a given sign relationship can be re-entered into another sign development process as a representamen in need of interpretation. Thus the theoretical argument developed in a book and represented by its title can become a rhematic symbolic legisign in a discussion of its historical influence.

This process of sign differentiation typically happens over just fractions of a second in everyday cognition, but it is also a constraint on the development of ideas in a constructive dialogue or even across historical time, as in the development of scientific concepts.

A pictorial example

The generation of higher order sign relationships via the interpretation of lower order sign relationships can be exemplified by considering how certain complex icons can be used to symbolize complex and subtle concepts. By themselves simple icons don't provide new information. Rather they bring to mind familiar objects or events by virtue of similarities. Consider for example the following three images shown in Figure 2.



Figure 2

The mother and child, the child playing with toys, and the puppet are each familiar icons to Western readers. But now consider this cover illustration from the *New Yorker* magazine shown in Figure 3.



Figure 3

In this image each of these icons is juxtaposed in ways that are not merely odd, but in many respects contradictory; each indicates an inverse correlate of some feature of the other. In this respect they each effectively point to each other as being inappropriate in the same figure. They *indicate* the reciprocally inappropriateness of being in this particular immediate relationship to one another. These juxtaposed incompatible icons point to each other by virtue of their specific inconsistency. As a result, a *system of complementary indexical relationships* is made apparent to anyone familiar with these component icons. And it is the general feature of this systemic absurdity, depicted as normal that is thereby communicated. Indeed, within a fraction of a second the icons, their relationships, and how they collectively indicate their inappropriateness, communicates

a complex and subtle conceptual message about the “dark” side of motherhood: the way loving mothers are slaves to their infants who are otherwise oblivious of this situation.

Semiosis and inference

I believe that the irreducible process-nature of semiosis is most clearly exemplified by a comparison with inference. Inference is a way that information given can allow one to conclude, predict, or project information not overtly given. The same can be said of every sign relationship. In many respects it appears that Peirce began his study of semiotic relationships as a result of his recognition that a fully-grounded theory of logic must ultimately make assumptions about the nature of representation. So one way to think about semiosis is to deconstruct Peirce’s categories of inference, working back to his individual sign categories.

In the three-by-three sign feature matrix presented above, Peirce identifies logical inference as the most developed form of sign: a delomic symbolic legisign. It is the most developed form because its interpretive foundation is displayed explicitly in the structure of the representamen. In a syllogism, for instance, it is the similarity (iconism) between terms in the separate propositions, and the linkages (indexicality) between terms in each proposition, that are recognized to be the basis for inferring another non-presented proposition according to one or another semiotic habit (abduction, deduction or induction). In this respect each lower order form of sign relationship is a compressed form of inference, in which the representamen does not contain within its structure a full trace of its supportive interpretive relationships.

Analogous to the description of semiosis presented above, we can use the classic syllogistic form to identify these component sign features. Thus in the syllogism: 1. All men are mortal. 2. Socrates is mortal. 3. Therefore Socrates is a man. Proposition 2 is analogous to a representamen, proposition 1 is analogous to the generation of an interpretant that assigns some significance to 2, and 3 is analogous to the object thereby brought into recognition by this relation. The relationship of Peirce’s three canonical forms of inference to more basic sign relationships can be more readily seen when we consider how each can be amplified, or made more forceful by iterating various features. Consider the following amplified variants of the classic syllogism just discussed.

1. Abductive amplification (categorization by iterating predicates)
 - All men are mortal, bipedal, featherless, & talk.
 - Socrates is mortal, bipedal, featherless, & talks.
 - Socrates is a man.*

2. Deductive amplification (transitivity by iterating rules)

All men are mortal.

All mortals had parents.

Socrates is a man.

Socrates had parents.

3. Inductive amplification (generalization by iterating cases)

Socrates is mortal.

Socrates is a man.

Plato is mortal.

Plato is a man.

All men are mortal.

Thus abduction is strengthened as similarities are enumerated (increasing iconism producing more precise categorization); deduction is given wider scope as multiple rules are linked and concatenated, allowing new more powerful rules to be discovered by cancellation of the intermediates (increasing the “reach” of indexicality); and induction is strengthened as more and more cases are enumerated in which the same system of relations are exhibited (increasing the relational support for symbolic generalization). Inference thereby provides an explicit example of the process nature of semiosis that is cryptically present in cognitive processes. In cognition below the level of overt inference no trace of the many interpretive phases is found in the structure of the representamen and these many phases are traversed with minimal awareness in mere fractions of a second.

Conclusions

I hope to have demonstrated the value of understanding Peirce’s taxonomic system as architectonic constraints on semiosis. Although this is not here applied to Peirce’s later more developed taxonomy of sign relations, I believe that the same approach can be adapted with only minor modification. Seen as a compositional interpretive process semiosis naturally exemplifies the essence of Peirce’s pragmatism. This is characteristic of the historical development of science, which brings an ever more elaborated series of interpretive approaches (e.g. new analytical and experimental techniques) to bear on a common representamen of interest. But the real strength of this dynamical perspective is in the way it exemplifies Peirce’s vision of semiosis both as the essence of mind and as the essence of the communication between minds, such as constitutes cultural and scientific processes more generally.

Donna Orange¹

16 Is Peirce's Fallibilism an Ethical Attitude?

... no matter how far science goes, those inferences which are uppermost in the mind of the investigator are very uncertain. They are on probation. They must have a fair trial and not be condemned till proved false beyond all reasonable doubt; and the moment that proof is reached, the investigator must be ready to abandon them without the slightest tenderness toward them. Thus, the scientific inquirer has to be always ready at a moment to abandon summarily all the theories to the study of which he has been devoting perhaps many years. (MS 595; EPII: 25, 1885).

Peirce's fallibilism, initially named ironically in reaction to the papal declaration of infallibility² in 1871, received many formulations throughout his life. This relatively late one appears in the only chapter of "Short Logic", begun in 1895. He had begun by defining all the logical terms he considered important: logic itself, reasoning, belief, judgment, sign, icon, index, and symbol with the astonishing clarity and originality we have come to expect from him. Throughout, however, we notice more than a hint that he considered logic more than a scientific endeavor; it included an ethical claim³, hence the obligation he expressed in our chosen quotation.

But let us look back. First we must notice that what Peirce came to call fallibilism named both a principle – with spreading roots and ramifications throughout his philosophy – and an attitude, reflected in our chosen quotation, but extending far beyond it. Of the attitude, he famously wrote that "out of a contrite fallibilism, combined with a high faith in the reality of knowledge, and an intense desire to find things out, all my philosophy has always seemed to me to grow..." (CP 1.14). While rebuking both theologians and book-scientists (contrasted with laboratory men), he resorted to religious language – contrition, faith – to express the humble devotion to truth required when surprising facts confront our preconceived ideas. Never block the road of inquiry. Faithfulness to scientific inquiry and evolutionary-love-ethics converged for him.

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² It is more than tempting to imagine what Peirce would be saying now, as a pope has abdicated his office. Has he suddenly become fallible like the rest of us?

³ "The principal business of logic is to ascertain whether given reasonings are good or bad, strong or weak" (EPII: 18).

As a principle, Peircean fallibilism most importantly links to the theory of abduction or hypothesis as the working scientist's everyday method, together with his phenomenologically understood categories. So for example, he wrote:

... perceptual judgments are to be regarded as an extreme case of abductive inferences, from which they differ in being absolutely beyond criticism. The abductive suggestion comes to us like a flash. It is an act of insight, though of extremely fallible insight (CP 5.181).

So the qualitative first, together with the impact of the second, is already fallibly if rudimentarily interpreted as a dynamical object. But what has happened here? The percept, “absolutely beyond criticism”, with its immediate claims imposed by firstness and secondness, has already sneaked into the realm of thirdness, generality, judgment, as Carl Hausman (Anderson & Hausman 2012b) explains. Somewhere between the immediate object and the dynamical object, between first with second, the flash of abductive suggestion or hypothesis arrives, to be regarded as tentative. With fallibility arrive the only absolutes in science: the requirement of humility, and the need for the community of scholars.

We can put humility aside for the moment, but the community of scholars is intrinsic to fallibilism itself. Whether in the physical sciences or in the human sciences, unless the flash of insight be brought to the community for consideration, testing, improvement, or possible discard, science becomes a sham, a form of ideology. The community of scholars, the beloved community, is indispensable to the growth of science, of truth, and every member of the community, as well as the community as a whole “has to be always ready at a moment to abandon summarily all the theories to the study of which he has been devoting perhaps many years”.

What Peirce would not question was the very conception of inquiry as fallible. We could say that a moral infallibilism lay beneath his scientific fallibilism, and we might not be far wrong. Years before he coined the word *fallibilism*, he told us not to doubt on paper (like Descartes) what we do not doubt in our hearts. And later, “Do you call it doubting to write down on a piece of paper that you doubt? If so, doubt has nothing to do with any serious business” (CP 5.416). Not for proclaiming “thou shalt not kill” did he fault Pope Pius IX, but for making *himself* the arbiter of infallible truth.

The “critical common-sensism” that I am calling infallibilism and the “contrite” scientific fallibilism expressed in my chosen quotation went together for Peirce (Misak 2004), and require each other. The critical common-sensist takes for granted a background of everyday beliefs, while working to keep one's abductive hypotheses – “mere conjectures”, Misak says (2004: 163) – held lightly. Thus one remains prepared for more surprising facts, and ready to learn from colleagues within the community of scholars. Walking on a bog, Peirce called it:

After a while, as Science progresses, it comes upon more solid ground. It is now entitled to reflect: this ground has held a long time without showing signs of yielding. I may hope that it will continue to hold for a great while longer. (CP 5.589).

Sandra Rosenthal calls this achieved ground “pragmatic certainty”, “The product of interpretive activity, she writes, “is about a ‘taken’ rather than a ‘given’” (Rosenthal 2004: 202).

One synonym for fallibilism in the logic of science, corrigibilism, suggests that the word means that all beliefs and theoretical tenets simply require testing in the fire of facts. Verificationism and non-falsifiability are familiar mid-twentieth century versions of this view. It seems clear, not only from Peirce's expostulations, but also from examining the web of his own beliefs, that his own understanding was far more complex than most of the views that go under the moniker of “fallibilism” today. He would surely have made up a name for it “ugly enough to be safe from kidnappers”. That said, let us look at some of the complexity, even beyond noting fallibilism's embeddedness in abductive inference and in his phenomenology.

One source of this complexity, which might have endeared Peirce to systems, chaos, and complexity theorists of today, is that, like them, he believed in real possibility and chance (tychism), i.e. in a non-necessitarian universe. A universe which actually develops, and which involves actual novelty, requires not only abductive inference, but ongoing receptiveness to the unexpected. Peirce taught us to expect surprising facts every so often. He thought *variety* the “most marked and obtrusive character of nature” (CP 1.159). Though Peirce might not have welcomed the name “chaos” for his cosmology, he might have found congenial as tychistic (theory of chance) contemporary complexity and general systems theories. Insisting on novelty, the ever emergent, and irreducibles (W. Coburn 2002; Galatzer-Levy 1997), these theories attempt to keep the road of inquiry open in contemporary studies of psychological development and therapeutic systems (W. Coburn 2009; Ghent 2002; Thelen & Smith 1994).

Indeed his synechism (theory of continuity), closely linked, for him, to his fallibilism (CP 1.141–179 “Fallibilism, Continuity, and Evolution”) made ridiculous any insistence on dogmatism and absolute certainty in science or religion. He understood that people could also ridicule fallibilism, which claims only that “people cannot attain absolute certainty concerning questions of fact . . . But to say that *if* there are two persons and each person has two eyes there *will be* four eyes is not a statement of a fact, but a statement about the system of number which is our own creation” (CP 1.149). But much more important, he went on to say, was the presupposition of continuity, that is, of infinity. That everything – time, for example – is infinitesimally joined, he thought, we must suppose,

and cannot really know. We must therefore be fallibilists. “Continuity involves infinity in the strictest sense, and infinity even in a less strict sense goes beyond the possibility of direct experience” (CP 1.167). We are now in the realm of “vitally important topics” where it makes sense “to adopt the hypothesis which leaves open the greatest field of possibilities” (CP 1.170). So, he concluded:

The principle of continuity is the idea of fallibilism objectified. For fallibilism is the doctrine that our knowledge is never absolute but always swims, as it were, in a continuum of uncertainty and of indeterminacy. Now the doctrine of continuity is that *all things* so swim in continua (CP 1.171).

Now let us return to the quote with which we began. What is the status of fallibilism itself? Is it an inference to be thrown into the trash-bin without regret or tenderness when it fails us? In what would such failure consist? First we must note that Peirce distinguished between absolute and practical fallibility. “But though nothing else is *absolutely* infallible, many propositions are *practically* infallible; such as the dicta of conscience” (CP 2.75). It seems to me that both his connecting of fallibilism to his presumption of a holistic universe, and his insistence on intellectual humility within a community of scholars suggest that fallibilism was not for him an inference but itself an ethical attitude. It selects for the trash-bin, but cannot go there itself. The quasi-religious language of contrition and faith supports my guess.

But what about this fallibilism as attitude, and what about Peirce the life-long theorist of religion and ethics? Several chapters of a recent book (Anderson & Hausmann 2012a) provide us with hints, and I hope that others will have chosen quotes to pursue these questions.

Maria de Lourdes Bacha¹

17 Peirce's Fallibilism in the Context of the Theory of Cognition and the Theory of Inquiry

All positive reasoning is of the nature of judging the proportion of something in a whole collection by the proportion found in a sample. Accordingly, there are three things to which we can never hope to attain by reasoning, namely, absolute certainty, absolute exactitude, absolute universality. We cannot be absolutely certain that our conclusions are even approximately true; for the sample may be utterly unlike the unsampled part of the collection. We cannot pretend to be even probably exact; because the sample consists of but a finite number of instances and only admits special values of the proportion sought.

Finally, even if we could ascertain with absolute certainty and exactness that the ratio of sinful men to all men was as 1 to 1; still among the infinite generations of men there would be room for any finite number of sinless men without violating the proportion. The case is the same with a seven legged calf. (CP 1.141, 1887).

In what follows, Peirce's passage CP 1.141 is analyzed in terms of his fallibilism in the context of both his theory of cognition and theory of inquiry. This passage appears in "Fallibilism, Continuity, and Evolution" (Vol. 1, Book 1, Chap. 3 Notes on Scientific Philosophy).

The first part of the text is about "positive reasoning" by which Peirce means the three fundamentally different kinds of reasoning – deduction, induction and hypothesis (CP 1.65) as well as "three things to which we can never hope to attain by reasoning", which refer to the theory of cognition and the theory of inquiry. The second part of the text is about probability and it will also be analyzed in the context of the theory of inquiry.

Between 1868 and 1869, Peirce developed his theory of cognition, which was complemented between 1877 and 1878 with his theory of inquiry. Peirce's theory of cognition is based on four propositions: "we have no power of introspection, but all knowledge of the internal world is derived by hypothetical reasoning from our knowledge of external facts; we have no power of intuition, but every cognition is determined logically by previous cognitions; we have no power of thinking without signs, and we have no conception of the absolutely incognizable" (CP 5.265). The theory of inquiry brings together the denial of intuition, of first premises, of introspection, and of incognizables with the theory of thought-signs (that reveals both Peirce's conceptions of knowledge and reality)

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and with the doubt-belief argument (doubt occurs when regularity and habit are disrupted and belief occurs when regularity and habit are established).

First, analyzing fallibilism from the point of view of the theory of cognition, it is worth remembering that inference is the essence of all thought and thought is a sign activity. In denying the existence of any intuitions, Peirce argues that all cognitions have an inferential nature and are not immediate and intuitional. An intuition is a premise not itself a conclusion, knowledge is a process of flowing inferences; thus knowledge is a self-corrective process. When examining the cognitive process, Peirce states that the generality of this process may be extended *ad infinitum*, which means that there is no such thing as first cognition. Reasoning is not just a matter of drawing inferences based on previous experiences. It is a creative view of many possibilities, including the prediction of future consequences, not only the most obvious but also the most comprehensive and wide-ranging ones. The conscious “I think” is replaced with the sign process; cognition consists of an inferential process the foundation of which lies on the triad of signs. The cognitive process is based on the principle of the triad of signs. When Peirce says that self-consciousness is inferential, ignorance and mistakes become characteristics of the process (CP 5.233).

Thought dynamics is one of the most distinctive features of Peirce’s theory; thinking is a dialogical process, in which an inner dialogue is established between different temporalities or phases of Self (Santaella 2004). Flow of thoughts consists of selecting arguments for and against, weighing each of them, analyzing them and, finally, making a decision. From that new position, it starts selecting arguments again, going forward and backward, until a balanced solution is found. The ability to imagine different situations is sensitive to objections, and is the real power of thought.

Thinking demands temporality and Peirce rejects the possibility of supporting knowledge in theories that come from individual consciousness without any relation to the external world; external facts establish the chain of cognition (CP 5.251). This means that there is no knowledge without interpretation due to the fact that knowledge is influenced by events prior to the cognition process and is revealed later, when it is interpreted by a following thought-sign. Because thinking is a process in time, reasoning of any type must be fallible. A mistake arises from the possibility of a fallible “self”. The experience in the outside world shapes our cognition and judgment (CP 5.249); external facts determine cognition. By clarifying the role of the exteriority of an object in the theory of reality as well as a point of view based on the signal structure of cognition, Peirce breaks with the traditional, nominalist view and proposes the equivalence “cognition=sign=reality”.

Thus, Peirce states that “all human thought and opinion contains an arbitrary, accidental element, dependent on the limitations in circumstances, power, and bent of the individual; an element of error, in short. But human opinion universally tends in the long run to a definite form which is the truth” (CP 8.12).

Considering the analysis from the point of view of the theory of inquiry, according to Peirce, inquiry starts from an uncomfortable state of doubt, which blocks the flow of usual actions, where it is not possible to choose among alternative courses of action. The process of inquiry is a struggle to overcome the irritation of doubt. This doubt from which the inquiry departs is a real doubt, genuine and not a theoretical pseudo-belief. Thus, scientific inquiry constitutes an effort to put an end to the initiating doubt and the truth would then be a state of belief unaffected by the doubt. The theory of inquiry can also be called the theory of scientific method, and for Peirce only the scientific method can lead us to the truth in a long-term perspective, which constitutes the dynamic process of inquiry.

In the early 1870s, Peirce's logic was still based on the classic logic, especially on the subject-predicate model of statements. From the discovery of relative logic on, Peirce started introducing statements not reduced to the subject-predicate form; right after that, he developed the three types of inference (deduction, induction and hypothesis) as distinctive, unchanging kinds of reasoning and/or argument, and finally stages of inquiry. For Peirce the division of every inference into abduction, deduction or induction can be presented as the key of logic (CP 2.98). In 1898, his understanding of induction was modified and the term abduction was adopted as preferential, but the idea of abduction is quite complex and was only solved around 1901, when it became the process of formulating an explanatory hypothesis (CP 5.171).

The theory of inquiry consists of a process in three stages: abduction, deduction and induction. Abduction constitutes the first stage of inquiry. Abduction starts with a surprising fact generating a hypothesis; abduction is the only logical operation that introduces any new idea (CP 7.217–8). The second stage, deduction, consists in deducing necessary consequences from the hypothesis (CP 2.755 or CP 6.469) and the third stage, induction, is that of ascertaining how far those consequents accord with experience, and of judging accordingly whether the hypothesis is sensibly correct, or requires some modifications, or must be entirely rejected (CP 6.472).

Abduction merely suggests that something may be; deduction proves that something must be; induction shows that something actually is operative. For Peirce, “the idea of probability essentially belongs to a kind of inference which is repeated indefinitely” (CP 2.652) and the discussion of probability naturally “brings us to the interesting question of the validity of induction” (CP 2.102).

The probability proper is also “an essentially inaccurate idea”; induction might be “accurately defined as the virtual inference of a probability” (CP 2.101–2).

Every induction involves some sort of interpretation of the sample, some sort of hypothesis about the whole, so it is quite fallible. “The rule requires that the sample should be drawn at random and independently from the whole lot sampled. That is to say, the sample must be taken according to a precept or method which, being applied over and over again indefinitely, would in the long run result in the drawing of any one set of instances as often as any other set of the same number” (CP 2.726).

The validity of induction is also being increasingly reinforced due to its self-corrective nature; the result of extending inferences based on samples is experiential and temporary and, in the long run, an inference that “used to be temporary, will be finally corrected” (CP 6.41). Induction is a method of reaching conclusions that, “if it be persisted in long enough, will assuredly correct any error concerning future experience into which it may temporarily lead us” (CP 2.769). The constant tendency of the inductive process to correct itself is the “essence” and “the marvel of it” (CP 2.729). Therefore, the process of inquiry is fallible for its very nature.

The logic of inquiry can be understood as a “map” to be followed in any kind of research. It consists of a cycle of abduction / deduction / induction / new abduction. . . The three stages of inquiry are harmoniously and interdependently connected in a way that the inquiry is outlined from the emergence of a hypothesis to the selection of arguments to the methods of theoretical construction to the test that supports (or refutes) the hypothesis, not to mention rights, wrongs, success and failure. This process is subjected to mistakes and hazards, but is also prone to self-correction.

Peirce’s theory of inquiry aims at understanding and assessing how the reasoning process of a scientific researcher works. Any study demands self-coherent discussion about how thoughts and arguments should be sorted in the quest for truth.

Another point to be stressed is that inquiry is directed towards the aims of social impulse, rather than an individual conscience, “the individual may not live to reach the truth; there is a residuum of error in every individual’s opinions” (CP 8.12). There is, then, to every question a true answer, a final conclusion, independent, not indeed of thought in general, but of all that is arbitrary and individual in thought; is quite independent of how you, or I, or any number of men think.

The pragmatist argues that truth and probability must connect with inquiry. Pragmatism as a connection between the meaning of a hypothesis and its experiential consequences “covers the entire logic of abduction”, because it gives a

rule to abduction and so puts a limit upon admissible hypotheses thus affecting also deduction (CP 5.196). If the hypotheses cannot be tested by induction, they are useless to scientific inquiry. "The surprising fact, C, is observed; But if A were true, C would be a matter of course, Hence, there is reason to suspect that A is true" (CP 5.189). Earlier Peirce's pragmatism makes the ultimate intellectual purport to consist in conceived conditional resolutions and therefore, the conditional propositions, with their hypothetical antecedents. Later Peirce would insist in a subjunctive formulation, the "will be" was replaced by "would be", the consequences are those which would occur under certain consequences, meaning that if an experiment E is conducted under some circumstances C, observable results would be R (Misak 1991).

It is worth mentioning that according to Rescher (1998), fallibilism is a doctrine in which "theories cannot be asserted as true categorically". Houser (2006) claims that historically and conceptually fallibilism is a doctrine closely aligned with scientific realism. Peirce also explains that the principle of continuity is the idea of "fallibilism objectified", because fallibilism is the doctrine that our knowledge "is never absolute but always swims, as it were, in a continuum of uncertainty and of indeterminacy" (CP 1.171).

In conclusion, it seems that there is not any doubt that fallibilism is crucial for the scientific attitude, because mistakes cannot be avoided. Fallibilism is undoubtedly "something deep and central for Peirce, a touch stone, in a sense for everything else" (Houser 2006).

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18 Diagrams or Rubbish

All reasoning is experimentation, and all experimentation is reasoning. If this be so, the conclusion for philosophy is very important, namely, there really is no reasoning that is not of the nature of diagrammatic, or mathematical, reasoning; and therefore we must admit no conceptions which are not susceptible of being represented in diagrammatic form. Ideas too lofty to be expressed in diagrams are mere rubbish for the purposes of philosophy. . . . Good reasoning is concerned with visual and muscular images. Auricular ideas are the source of most unsound thinking. (W8: 24, 1890).

Over a century following Peirce's pronouncement, philosophers have yet to realize the tantalizing dimensions that the diagrammatic perspective bestows on the nature of philosophical analysis and the fertility of reasoning.

What is the philosophical relevance of diagrams? Peirce mentions the 'idea expression'. Diagrams are not to be conceived in a naturalistic fashion, or in terms of their opposition to the symbolic or the conventional, but as a specific class of representational forms with characterisable properties and expressive power.

Natural languages are maximally expressive for representation and communication. Maybe diagrams can do the same for ideas and reasoning? What are the key properties of diagrams? In common parlance, diagrams are associated with a rather heterogeneous set of qualities. One routinely finds it asserted that a diagram is a geometric structure, usually realized as a two-dimensional representation on a sheet of paper or computer screen. Equally often diagrams are thought to be symbols and, in particular, visual symbols.

Examples are endless: infograms, flowcharts and entity-relationship diagrams, mental models, blends, mind maps, automata, semantic nets, neural networks, Feynman diagrams, Penrose tilings, commutation diagrams, tableaux, distributive normal forms, and so forth. Heterogeneous logics and conceptual graphs are widespread in computer science and knowledge representation. Visual languages in knowledge engineering and design are contemporary tools of the trade. Cognitive, spatio-temporal and kinaesthetic aspects of perceptual notations are familiar to psychologists, cognitive scientists and learning theorists. Neuroscientists have found out how the mind's eye tracks the visual dimensions of language and other notations. Scientists and historians of science have noted the central role of schematic thinking in major scientific discoveries and technological innovations. Physicists and chemists rely on diagrams in coming to grasp the reality of physical phenomena.

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The connections between diagrams and reality are not limited to the exact and natural sciences. Roman Jakobson famously noticed how representing linguistic material with diagrams shoots down structuralism. Moholy-Nagy represented motion by comparing visual abstraction to meaning. One might even take someone like Kandinsky, who fashioned diagrams to picture relationships between the elements of design; idea remarkably similar to the line in Peirce's logical diagrams: the "track made by the moving point; that is, its product . . . created by movement – specifically through the destruction of intense, self-contained repose of the point" (Kandinsky 1926/1979: 57).

Diagrams need not be geometric. They need not be based on metric systems of representation. The idea of diagrams may be realized as a topology, for instance. Diagrams extend the two or three-dimensional. Models of higher-dimensional algebras surely count as diagrams, though they cannot be drawn or visualized on a computer screen. The predominant feature of diagrams is not in symbols, which signify by virtue of being associated with conventions of interpretation. Diagrams are predominantly *iconic*, interpreted according to their self-ascribed precepts of representation. Just as languages need not be vocal, diagrams need not be flatly visual, either, as they appeal to the broad diversity of modes of sensing and perceiving diagrammatic structures (Pietarinen 2010).

The question of what a diagram is thus boils down to questions of use, function, expressivity and variability in modes of representation. What is the information diagrams bring about, and how does it differ from what natural languages are capable of expressing?

Peirce understood logic in the wide sense of *formal semeiotic*, a study of the processes of when, in using signs, we come to a position in which to acquire information about their objects by reasoning, experiment and observation. But these processes are not to be equated with what after Peirce came to be the dominating paradigm of *symbolic* reasoning. Logic came to highlight the idea that it is the *logical truth* that could be formally captured and tamed, without reference to the signification of logical constants. True, Peirce recognized well how to pursue such formal avenues. But he did not take the "illative permissibilities" (MS 478) to constitute the real logical inquiry in which we are interested in the real cases of representing, reasoning and communicating the information that signs convey. How language links to reality, or how "the diagram is to be connected with nature" (CP 3.423) are the predominant, living concerns of meaning. Peirce's forays in formal semeiotic were profoundly on what we nowadays recognize as the semantic and model theoretic – as well as that of the pragmatic – nowhere as clear as in his theory of diagrams as the method of Existential Graphs (EG).

EGs are perhaps the first instance in logic in which the prospects of model theory were realized in depth (Pietarinen 2006). Peirce stated that “it is not surprising that the idea of thirdness, or mediation, should be scarcely discernible when the *representative character* [iconicity] of the *diagram* is left out of account”. The target of his criticism was Kempe’s formal characterization of reasoning and truth, the inadequacy of studying the diagram’s “self-contained relations” (CP 3.423; Pietarinen 2009). The iconic character of logical constants is different: iconic signs connect the representative characters of diagrams with their objects in specific qualities which self-contained relations cannot reveal. Diagrams open up wider vistas in logical theories than proof-theoretic transformations can do. The upshot was a systematic progression from the concept of a diagram to the concept of a living, logical diagram.

A deficient aptitude for language is a relatively common syndrome. It may imply a preference for representations not evidently linguistic. Peirce took these deficiencies to give rise to another, better way of tackling the meanings of assertions:

I do not think I ever *reflect* in words: I employ visual diagrams, firstly, because this way of thinking is my natural language of self-communion, and secondly, because I am convinced that it is the best system for the purpose [of logical analysis]. (MS 619).

We form in the imagination some sort of diagrammatic, that is, iconic, representation of the facts, as skeletonized as possible. The impression of the present writer is that with ordinary persons this is always a *visual image*, or *mixed visual and muscular*; but this is an opinion not founded on any systematic examination. (CP 2.778).

But inaptitude towards language does not entail the visuality of diagrammatic thinking. Rather, what is at issue is the alignment of muscular elements of diagrams with visual ones: the *embodiment* of meaning. Yet these muscular elements are pregnant with logical content and their workings undeterred by psychological aspects of thought.

Testimonies from scientists such as Einstein and Feynman vividly show how diagrammatic thinking results from the play of imagination striving to abduce properties of physical systems. The processes of reasoning involved can be made rigorous in the method of EGs, the “system for diagrammatizing intellectual cognition” (MS 292: 41), which analyses reasoning into its minute parts. Not merely too lofty for the purpose of serious philosophizing, ideas that have not been seized in the exact forms of diagrammatic imagination run the risk of not playing any part in intellectual cognition at all.

The large-scale importance of logical diagrams in inquiry is shown by Peirce’s confession that EGs “have a remarkable likeness to my thoughts about any topic of philosophy” (MS 619: 8–9). For him, diagram is a precise snapshot of particular

thoughts of the mind. As a representation of the mind, logical diagrams show it as a “rough and generalized diagram” though a better one than what “could be conveyed by any abstract account of it” (MS 490). Depicting the mind well calls for the use of logic to capture the meaning of *general* and *indefinite propositions*. Depicting well the thoughts produced by minds, on the other hand, hinges upon *definite* and *determinate* diagrams. Mind is a sign-creating factory whose engine is powered by reasoning. By definite Peirce means a lack of vagueness and by determinate that diagrams are not general. Definite and determinate diagrams represent single assertions in iconic forms.

The gravity of diagrams thus lies in great measure in their capacity to render the content of thoughts rigorous. How they accomplish this relies on the fact that the *universe of discourse* they communicate about is determinate and part of the mutually agreed and known *common ground* of the agents who undertake to discourse upon it. The idea of the plurality of universes of discourse was the hallmark of modern logic in the latter half of the 19th century.

Thoughts, on the other hand, are not regimented in the same manner as their contents are, and so vagueness and generality are unavoidable. To mitigate them, experimenting on diagrams is called for:

The Diagram sufficiently partakes of the percussivity of a Percept to determine, as its Dynamic, or Middle, Interpretant, a state [of] activity in the Interpreter, mingled with curiosity. As usual, this mixture leads to Experimentation. It is the *normal logical effect*; that is to say, it not only happens in the cortex of the human brain, but must plainly happen in every Quasi-mind in which Signs of all kinds have a vitality of their own. (MS 293: 14–15).

Whenever a diagram that aims at a representation of thoughts is formed, reasoning as its inevitable effect is called to action. We find the clarification of the meaning of what initially remained vague not in the diagrams as such but in the effects of experimenting on the relationships exhibited in diagrams.

As diagrams are not perfect pictures of the mind, they aim at preserving its essential structure. Here Peirce’s famous doctrine of *hypostatic abstraction* is called for. Abstraction aims at preserving the essential properties of the object by placing the thought as the object of the thought. In topology, one aims at preserving some essential property of the object such as the nearness of points on a surface while you never need to pinpoint exactly where those points are.

Peirce’s preferred framework for analyzing abstraction was the *logic of potentials*, developed in the gamma part of EGs (Pietarinen 2014). The term ‘potentials’ is familiar from physics, such as voltage as the difference between potentials, the centre of gravitation as the potential of gravitational lines crossing each other, or the quantum mechanical gauge transformations as potentials

from which Maxwell's equations can be drawn as a corollary. What is common to all these conceptions is that they refer to the real features of systems under investigation which nonetheless need not actually exist. The facts that these notions express are imaginary and yet real. By virtue of being higher-order, Peirce's logic of potentials is capable of accommodating virtually all of mathematics. Thus anything worth expressing can be expressed in that logic. Since mathematical comprehension precedes all others in Peirce's classification for sciences, what else can one hope for?

But the logic of potentials, despite interpreted, does not qualify as a diagrammatic *language*. The notion of identity makes the system behave such that it no longer shares the properties typically taken to constitute languages, such as *compositionality*. The lines of identity can cross the cuts without being broken apart into constellations of lines (ligatures). Peirce noted this distinctive feature of higher-order diagrams. He was interested in meanings that may not be propositional. Non-propositional signs can only exist as constituents of propositions, but propositions cannot be built up of non-propositional signs. Non-propositional signs are not assigned semantic attributes by the Utterers or the Interpreters (Pietarinen 2005). This violates compositionality, because the principle asserts that the meaning of the proposition must come from the meaning of its constituents and their proper combination.

But if diagrams are not languages they transcend the limits of linguistic signs. Importantly, that the logic of potentials no longer counts as a diagrammatic language suggests that the empirical distinction – yet another dogma of empiricism if you will – of what is a logical diagram and what is an extra-logical diagram cannot be maintained. Creating the *logical vs. extra-logical* barrier is emblematic of the acceptance of one more dogma of empiricism. Rejecting it, in contrast, is to accept *contrite fallibilism* in its entirety. Peirce's fallibilist and pragmaticist methodology advises us that inquiry is better off when not deciding in advance what could be studied by logic and what to consign to something extra-logical. The logical and the extra-logical stands in the same ballpark as the formal and the empirical, analysis and synthesis, or matter and experience. But the general concept of a diagram is investigated within the theoretical context of representation, reasoning and experimentation. Solely empirical notion of general diagrams does not make much sense: such diagrams would not *assert* anything and would thus lack the *effects* of experimental reasoning and intellectual ratiocination.

What is it that can be expressed by diagrams? What is the nature of the information contained in them? To understand expressivity, we must study the classes of models of diagrams. But we cannot study such models without having a definite logical rendering of the concept of a diagram. The theory of EGs can nevertheless be used for this purpose.

Hence it must be held very perceptive for Peirce to suggest a possibility for a meta-theory for the second-order diagrammatic logic of potentials over a century ago. Meta-theory was more important than having the proof-theoretic, illative rules of transformation. (He even surmised that such permissive rules form an incomplete set thus unhelpful in understanding the meaning of higher-order diagrams, MS 478). The second-order logic of potentials was “mathematics in a diagram’s clothing”. But a diagrammatic logic of potentials, despite interpreted, disqualifies as a diagrammatic language, in so far as a diagrammatic language is required to share the characteristic properties of natural languages. However, there is a general concept of diagrams, quite unlike languages, in the offing for all serious purposes of philosophy.

A consistent, simple and easily intelligible system of representation is needed for analysing the diagrammatic signs that represent the various systems of relations:

A *Diagram* is a representamen which is predominantly an icon of relations and is aided to be so by conventions. Indices are also more or less used. It should be carried out upon a *perfectly consistent system of representation*, one founded upon a simple and easily intelligible basic idea. (MS 492: 1).

A perfectly consistent system of representation can be nothing else than logic. Indeed, from such considerations of what a diagram is – as well as what it is not – Peirce proceeded to present his method of EGs.

Summing up the essential properties required of Peirce’s notion of a diagram, we have the iconically representative character as a product of rational mind acquainted with natural relations, definiteness and determinateness, universes of discourse and the common ground, non-psychologism about reasoning, and perfect consistency of representation. The logical theory of diagrams is the theory of formal semeiotic. To understand the nature of diagrams calls for a development of the theory of diagrams as part of the development of the theory of semeiotic.

To conclude with Peirce: Certain other conceptions of modern mathematics are indispensable to a philosophy which is to be upon the intellectual level of our age. (W8: 89, “Architecture of Theories. Initial Version”, 1890). In his later years Peirce was much occupied with the nature of reasoning in mathematics. He solved this question in the 1903 Lowell Lectures in terms of the higher-order logic of potentials, capturing both the abstraction and the expressivity needed for the erection of a comprehensive theory of the meaning of intellectual thought. It would have to include a method for a minute analysis of the nature of mathematical reasoning. That theory was to become the pragmatism of his later years (Pietarinen 2011).

Victoria N. Alexander¹

19 How does Cognition come from Chance?

By thus admitting pure spontaneity or life as a character of the universe, acting always and everywhere though restrained within narrow bounds by law, producing infinitesimal departures from law continually, and great ones with infinite infrequency, I account for all the variety and diversity of the universe, in the only sense which the really *sui generis* and new can be said to be accounted for. (EPI: 308, 1892).

In “The Doctrine of Necessity Examined” (1892), from which the above quote is taken, C. S. Peirce argues that the mechanistic hypothesis – initially posited by Democritus and seemingly confirmed by the lawful regularities discovered by Newton – has never been proved. Peirce notes that he is instead obliged to assume, along with Epicurus (and Aristotle after him), that “atoms swerve from their courses by spontaneous chance” (EPI: 298).

What Peirce means by “chance” in this instance appears to be a lack of identity between things categorized as virtually the same: sample irregularity. In this essay, part of the *Monist* Metaphysical Series (1891–1893), “chance” and “spontaneity” are often used by Peirce interchangeably to refer to an unlawfulness inherent in particularity. As he notes in an earlier but related essay, “The Doctrine of Chances” (1878), “‘if A, then B,’ means nothing with reference to a single case” (EPI: 147). Likewise in one of the series essays, “The Architecture of Theories” (1891), he states, “When we come to atoms, the presumption in favor of a simple law seems very slender. There is room for serious doubt whether the fundamental laws of mechanics hold good for single atoms . . .” (EPI: 288). Peirce reasons that since finer and finer measurements tend to yield more and more unpredictable results, this indicates that the “lawful” regularity of things (*e.g.* atoms, molecules) is the probabilistic outcome of large sample sizes. One should expect, therefore, that the more numerous and irregular the parts are to the whole, the more predictable the whole’s behavior will be.² Due

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² For example, if we have a bag of a dozen beans with equal number of black beans and white beans, every time we draw one bean, the result will be about as predictable as a fair coin. If we have a bag of 10,000 beans of every shade of gray in between black and white, every time we take a sample of one bean, the result will almost always be gray. The second “system” is more predictable. A quantum mechanical (QM) system is more like the bag with 10,000 irregular beans. A heart is more like the bag with twelve black or white beans. The number of different quantum states is vastly greater than the number of cells in a heart. Heart cells are either on or off, none are “gray”. So if we were to look at both systems through a statistical lens, the heart,

to a fundamentally irregular nature of matter and differences of scale, chemistry would be inherently more regular than biology, and the degree of irregularity in biology would be ontological, not a product of measurement error, according to Peirce.

Peirce furthermore argues the mechanistic hypothesis is fundamentally illogical anyway, since it neither accounts for the regularity it merely assumes, nor explains why there is growth and change, which, he argues, can only be explained by departures from regularity. As he writes in “The Architecture of Theories”, “exact law obviously never can produce heterogeneity out of homogeneity” (EPI: 289). Although I am not convinced that this is obviously true, it does seem reasonable to assume that the fundamental nature of things is irregular since this at least explains regularity as a product of statistical averaging.

In these arguments, Peirce is actually clearing the way so that he can get to the argument he really wants to make. He wants to argue that “*sui generis*”, that is, self-causation, is possible. He seeks to falsify the theory that “minds are part of the physical world in such a sense that the laws of mechanics determine everything that happens according to immutable attractions and repulsions” (EPI: 300). He believed that humans are in some sense in control of their actions insofar as their thoughts, self-caused, contribute to those actions.

If the mechanistic hypothesis is the only thing standing in the way of the argument for “free will”, it thus being removed, does it necessarily follow that living organisms are then indeed capable of making choices? Or does this merely make cognition the product of clockwork with a few loose gears? Some popular postmodern readings of Peirce make all actions somewhat indeterminate, and make our would-be wills thus ruled by chance rather than by law. But this is not as Peirce would have it. His chance is “in the form of a spontaneity which is to some degree regular” (EPI: 310). This is the salient point. It is not the idea of “pure” spontaneity but the idea of a “to some degree regular” spontaneity that is the most insightful part of Peirce’s theory of the origins of cognition.

It is not clear to me that Peirce successfully describes the mechanisms (whether formal or physical) that makes chance “to some to degree regular” or that he applies this idea explicitly enough to account for the emergence of

as a whole, is more unpredictable and more sensitive to environmental factors, i.e. sampling. Because of the vast difference of scale, when we interact with (i.e. sample) a QM system as matter, we do so via very large sample sizes (not with particles), hence the predictability. An atomic clock keeps time very well, a heart not so well. However, it should also be noted that a different kind of unpredictability emerges in living systems. The parts of living systems are correlated, while quantum states are not. Formal constraints, not found in QM systems, are present in living systems and result in higher level *regularities* that cannot be predicted using statistical methods.

cognition. Nevertheless, as noted by Prigogine and Stengers (1984), he does sketch out, in “Design and Chance” (1883–84), a fairly remarkable description of how chance, constraints and iteration might lead to self-organization, or as he called it, “habit taking”. For Peirce, chance plays a role in a “principle of generalization, or tendency to form habits, which . . . produced all regularities” (EPI: 310).

Coming as it does at the end of the nineteenth century, Peirce’s theory that determinism is probabilistic certainly anticipates quantum mechanics. Quantum field physicist Lee Smolin (2013) has noted that Peirce may have been the first modern to recognize the evolutionary nature of physical laws. As noted above, he was ahead of his time as well with regard to the theory of self-organization that developed in the late 1980s and throughout the 1990s. Peirce may have been first to argue explicitly that chance, rather than law, is behind self-organization just as it is behind determinism. Previous theories of self-organization, investigated under the heading of ‘teleology,’ do not fully appreciate the role of chance, though, fruitful ‘coincidence,’ miraculous or otherwise, does more or less haunt all descriptions of final causality throughout history (Alexander 2011).

It seems to me that the chance Peirce sees behind self-organization is not the same as the chance he describes as being behind probabilistic determinism. Nevertheless, Peirce often uses the same term to refer to both types of outcomes. They are fundamentally similar in a number of ways. No efficient cause or applied force is necessary for either to evolve. In both cases, a bias emerges that affects the probability of certain kinds of events occurring. Therefore chance is a different type of cause than efficient cause. To continue with Aristotle’s terms, which Peirce also employs, we may say that chance is a type of formal cause. (If a form or tendency created in this manner is functional for a system that produces it, chance is also a final cause). In the case of probabilistic determinism, the more numerous types of configurations tend to be effectual. In the case of self-organization, physical relations between different configurations tend to be effectual.

In the essay “The Law of Mind”, Peirce begins to make a distinction between the discontinuous and continuous tendencies of chance. I understand his concept of “tychism” as the irregularities that tend to be averaged out and his concept of “synechism” as the sorting of irregularities. In the first case, rare irregularities do not matter; in the second case they do. Peirce notes that disparate things may be physically associated by contiguity or similarity. The physical biases that constrain the probability of various iterative physical processes (this can be the way the shapes of molecules fit together or not, to take one example) operate in a mind-like way because they depend upon these types of *relations* or generalizations that group similar things apart from dissimilar things. If a

general “mind”, (we might say any self-organizing system) can only interact meaningfully (*i.e.* sustaining itself) with things that are similar or contiguous, such constrained behavior will have a regularizing effect on the “mind” and thereby cause what Peirce calls “spreading” and “further generalization” leading to continuity. We can observe this phenomenon in such simple examples as flocking or swarming. Animal cognition, according to Peirce, is but a complexification of this process.

Although today science may have exchanged a classical deterministic view of causality for a probabilistic one, similar in some respects to Peirce’s view, many scientists treat the change of circumstance with indifference. Because quantum states are uncorrelated, they do lead to statistical regularity, and probabilistic descriptions seem to work very well to describe the long-term behavior of quantum mechanical systems, and this sets the stage of determinism in the macro-world. In other words, it seems that great “departures from law” do not occur in the macro-world, not even with “infinite infrequency”. Thus, many still believe, despite the probabilistic nature of determinism, that the behavior of all biological systems can in theory, if not in practice, be predicted from the laws of physics.

For the sake of simplicity let us say that the jury is still out as to whether or not irregularities of the quantum world (assuming they do, in fact, exist) can seep through to the macro-world enough to have effects. We also note that there are differences of opinion as to whether or not the variety we observe in the world is due to underlying fundamental irregularities which are semiotically constrained (as Peirce thought), or whether the various forms only appear to be novel but are really just different configurations of the “same” atoms and there is nothing new under the sun (as some determinists believe), or whether variety is the result of some yet unexplained mechanisms that lead to radical emergence (as complexity scientists believe).

Accepting probabilistic-determinism, complexity scientists nevertheless argue that effective factors emerge in complex system interactions that produce unpredictability. That is, it may not be necessary to assume that primordial irregularity significantly affects the macro-world to believe in the possibility of emergent variety. It may be the case that novelty can emerge even in a “fully deterministic system” (*i.e.* a system above the quantum level in which *efficient* causes operate, without swerving, according to Newton’s laws) because *formal* causes are also present and can affect outcomes. Thus perhaps we do not have to decide whether or not Peirce is correct when he asserts, “exact law obviously never can produce heterogeneity out of homogeneity” (EPI: 289).

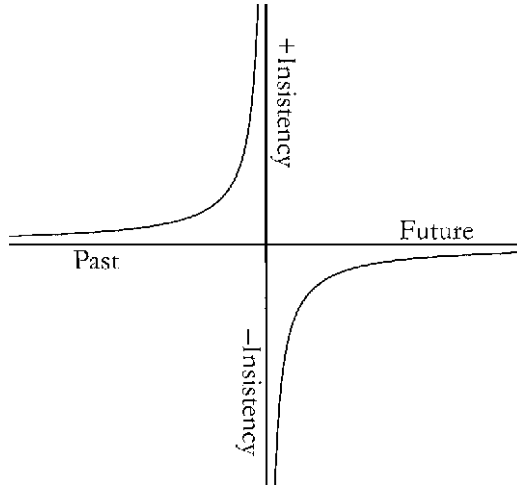
In 1986 nonlinear dynamics theorists (Crutchfield et al.) proposed that “the exercise of will”, in the form of the ability to make choices using cognition, may

be understood as the local structuring of random changes. The authors claim intentionality may manifest itself in the peculiar and dynamically stable way a complex system responds to and benefits from patterns found in various sources of randomness (e.g. Brownian motion) found in fully probabilistically “determined” systems, i.e. at the macro-level where quantum irregularities are irrelevant. This idea of emergent will is consistent with Peirce’s theory that mind-like associations (physical biases inherent in relations of similarity and contiguity) are the precursors of the brain behavior that gives rise to cognition. Although complexity scientists have not been able to explain precisely how such emergence occurs in the “black box” of complex systems (Goldstein 1999), applying Peirce’s semiotics to the problem of emergence (e.g. Emmeche 2000; Alexander 2011; Deacon 2011) promises a better understanding of how complex systems create representations in the form of habitual behaviors – which they use to interact with their environments in ways that can be said to be self-caused. Representations may be used in error, for good or ill, and this grants these systems the potential for adaptability and makes their responses to the environment *interpretive*, not merely mechanically reactive. Thus semiosis may be a formal mechanism by which irreducibility, unpredictability or chance emerges in the macro-level probabilistically determined world.

In conclusion, Peirce’s theory that primordial nature is irregular may be somewhat vindicated by the discovery of the quantum mechanical world. Although tychism may not be directly responsible for *sui generis* as the above quote proclaims, synechism, which he develops using semiotic notions, adds some teeth, as it were, to chance, such that slight differences (irregularities) might make a significant difference. Thus it may be semiosis, or chance *as* semiosis, not chance irregularities *per se*, which is the cause of interpretive responses and cognitive choice.

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20 Peirce's Graph of "a Sort of Equilateral Hyperbola"



(Law of Mind (W8: 150)).

This graph, which appears in “The Law of Mind” (W8: 150), provides a particularly emblematic example of Peirce’s use of icons in philosophical writing. Peirce offered this particular graph as the answer to the question “what is meant by saying that one idea affects another?” (W8: 148); its verbal interpretation is that “the future is suggested by, or rather is influenced by the suggestions of, the past” (W8: 150). Peirce wrote that “a great distinguishing property of the icon is that by the direct observation of it other truths concerning its object can be discovered than those which suffice to determine its construction” (CP 2.279). Inspection of this graph indeed suggests something additional about how the past affects the future. The immediately past idea—which is still partially in mind, and thus not entirely past – exerts *nearly complete* influence on the present, with its “Insistency” rising toward infinity at the present moment. The very next moment’s idea, whatever it may be, exerts almost *no necessary* influence on the present. While my very next idea may be related directly to my present thought, it does not influence my present thought, and it may just as easily come from something else, such as a doorbell or telephone, that appears in my experience

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as a discontinuous interruption. As we look further into the future, though, the ideas that are “fated” to be thought gain an increasing insistency relative to the present idea. The right-hand side of the graph thus portrays one of Peirce’s central ideas about the development of thought: “The opinion which is fated to be ultimately agreed to by all who investigate, is what we mean by the truth, and the object represented in this opinion is the real” (W3: 273). The “Law of Mind” graph presents the key idea of *an asymptotic approach to a limit*, and in particular, of the gradual approach of thought toward truth.

While Peirce was clearly fond of visual representations of ideas, as is most dramatically exemplified in his development and discussion of Existential Graphs, it is illuminating to explore the reason for this preference. In short, icons constitute the most fundamental component of thought. According to Peirce, “The only way of directly communicating an idea is by means of an icon; and every indirect method of communicating an idea must depend for its establishment upon the use of an icon” (CP 2.278). Words and other discursive sign-systems that may be used to construct arguments possess extraordinary power for facilitating thought. Peirce insists, however, that all such systems rely upon the workings of metaphor, broadly understood. Metaphor – itself a kind of icon – is fundamental to language and thought. As George Lakoff & Mark Johnson put it, “metaphor is conceptual and everyday thought is largely metaphorical” (1999: 118).

While this is a welcome move away from the view that propositions are the fundamental elements of thought, it raises the question of how we “get” metaphors in the first place. According to Peirce, metaphors incorporate and rely upon a more basic kind of icon, the diagram, which in turn relies on the *most* basic kind of icon, the image (CP 2.277). As he wrote in a fragment shortly before beginning work on the series of articles that includes “The Law of Mind”, “Words, though doubtless necessary to developed thought, play but a secondary role in the process; while the diagram, or icon, capable of being manipulated and experimented upon, is all-important . . . [T]here really is no reasoning that is not of the nature of diagrammatic, or mathematical, reasoning” (W8: 24). Metaphorical thinking thus presupposes diagram- and image-based thinking, “the recognition of diagrammatic schemas in one phenomenon which may be used in understanding another” (Stjernfelt 2000: 360–61). Peirce’s graph of “a sort of equilateral hyperbola”² suggests the *metaphor* that “the law of mind” is a function (thought) whose value gradually approaches a distant limit (truth).

² The hyperbola is a familiar icon from mathematics: one algebraic function that would fit this diagram is $Y=K/x$ where K is any positive number.

This metaphor is conveyed by means of the graph, a special kind of *diagram*,³ which shows the curves gradually approaching straight lines. The diagram in turn functions via the underlying *image* that is constituted by the simple arrangement of two pairs of curved and straight lines. Thought and meaning advance via metaphor; metaphor relies upon the diagram's representing the relations "of the parts of one thing by analogous relations in [its] own parts"; the diagram represents these relations in virtue of the image's intrinsic "simple" quality (CP 2.277).

This would seem to bring the question of meaning and thought down to the question of how we could ever "get" an *idea* from the simple quality of an *image*. To put the question this way, however, is to miss the radically fundamental role of iconicity for thought. The image, diagram, or metaphor, as an icon, is a direct presentation or manifestation of an idea. The "simple" quality of the image is just that – it is a complete, distinctive form. While we can certainly separate out its smaller constituent parts, such as the lines and curves in the "Law of Mind" graph, to do so would mean destroying *this* form and creating images of several *other* complete and distinctive forms. The form presented in the image is a "First Firstness", a self-sufficient idea. As Joseph Ransdell has pointed out, this means that "there is *no* distinction between an icon and *its* object just insofar as the icon is truly iconic with it" (Ransdell, section 5). Peirce writes that "A sign by Firstness is an image of its object and, more strictly speaking, can only be an *idea*. For it must produce an Interpretant idea; and an external object excites an idea by a reaction upon the brain" (CP 2.276). To say that I "get" (perceive, apprehend, know) the image is to say that I "get" its simple form or idea, immediately and directly. The form or idea is not *extracted* from the icon; the icon is identical with the form or idea and it becomes my thought when there is an appropriate existential, physical encounter with the material image in the world.

These two insights, that iconicity is the fundamental mode of representation for all thought, and that in apprehending an icon we directly apprehend the form or idea, may help resolve some problems concerning the concept of imitation. To take only one such problem that is alive in contemporary discussions, we might consider the central role that Johnson identifies for imitation in the construction of meaning. The first steps toward locating oneself in a meaningful world inhabited by other persons involve the infant's ability to imitate the actions of another, most typically the mother. Johnson suggests that humans, including newborns, have a kind of "body scheme" that unifies multiple senses,

³ Peirce turns the line *diagram* into a *graph* by adding the words "Past", "Future", and "Insistency", with positive and negative value indicators. Stjernfelt proposes a taxonomy of diagrams that includes maps (simple diagrams), algebra (construction precepts), and graphs (which combine simple diagrams and construction precepts) (376).

and in which another person's actions can be mimicked or reproduced; in a search for a more empirically-confirmable basis for this crucial ability, he also suggests that the intriguing mirror-neuron system underlies the imitative behavior (Johnson 2007: 38–39). Both of these explanations – and they are not mutually exclusive – are promising, but they are limited in a certain sense. Johnson's ultimate project is to explain the basis of meaning in general, including complex aesthetic meaning. If explanations of “meaning” invoke particular human neurological structures, or peculiarly human body schemas, “meaning” may be inadvertently conscribed as a uniquely human phenomenon. An understanding of mimesis or imitation⁴ in terms of iconicity provides an additional, more generic level of explanation. This kind of explanation can include but is not restricted to the particularly human theaters of meaning that Johnson discusses. Since Peircean iconicity can occur wherever there is an interpretant that directly expresses an icon, it leaves the way open to consider the nature and possibility of meaning even for very unusual or non-human minds.

⁴ Ransdell identifies fourteen locations in CP where Peirce employs a variety of terms to suggest the relation between the iconic representamen and its object. Among these terms are: similarity, likeness, analogy, and resemblance (Ransdell, note 5).

Daniel Chandler¹

21 Icons and Indices Assert Nothing

Icons and indices assert nothing. (CP 2.291, 1893).

What exactly was Peirce claiming when he wrote that “icons and indices assert nothing”? In logical terms, assertions are expressed in the form of *propositions*, and propositional status is subject to several basic criteria. Firstly, for a sign to express a proposition, Peirce tells us, it must be possible for it to be ‘interpreted by’ (translated into) a sentence. He adds that not all sentences are propositional statements: expressing a proposition requires the indicative (or declarative) mood (ibid.; CP 2.315). Propositional sentences can be preceded by declarative phrases such as ‘I know that...’ or ‘He claims that...’. Peirce also insists that a proposition cannot be expressed in the form of an iconic sign (such as a picture), which represents its object ‘mainly by its similarity’ (CP 2.276), arguing that an iconic sign can be interpreted only in a ‘potential’ or subjunctive mood (e.g. “Suppose a figure has three sides”) (CP 2.291). Nor can a proposition be expressed in the imperative mood or by other indexical signs which “direct the attention to their objects by blind compulsion” (CP 2.306; CP 2.315) – such as the gesture to ‘Hush!’

Secondly, by definition, a proposition is either true or false (CP 2.321; EPII: 167). A true proposition provides us with reliable facts about (and thus representations of) reality. This second criterion has widely been seen as a corollary of the first: to be true or false signs must be both discursive and declarative – a criterion excluding not only pictures but also such linguistic forms as questions, warnings, commands, requests and promises. Thus far, then, Peirce is claiming that icons and indices cannot make statements, and cannot be true or false propositions. Even today, propositions are defined in philosophical reference works in terms of these criteria (Bunnin & Yu 2004: 567–8).

Thirdly, logicians have traditionally noted that to carry truth-values, any system of representation must have a syntactic structure with two connected but analytically separable and distinct elements – a *subject* and a *predicate* (CP 1.559; CP 2.315; CP 2.328). In both logic and grammar, a subject is what we make an assertion about, and a predicate is what we assert about it (CP 4.41). In traditional logic, the *copula* is a coupling device (‘is’, ‘are’, ‘is not’, ‘are not’) used to link the subject and the predicate, although for Peirce, subsuming this ‘purely

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formal' element within the predicate gives 'the simplest and most satisfactory account of the proposition' (CP 2.343; CP 2.328; cf. CP 1.548; CP 2.319). Indeed, in a more general sense, "the matter of a proposition is said to be its subject and predicate, while the copula is its form" (CP 6.363). The *copula* is often defined as that which expresses the relation between the subject-term and the predicate-term of a proposition. But . . . "the essential office of the copula is to express a relation of a general term or terms to the universe" (CP 3.621). In this sense, the copula is the 'signal of assertion' (CP 3.420). Typically it is argued that without a subject-predicate structure it is impossible to determine which statement is being made. Sentences, of course, have a syntax (although the syntax of a sentence is not always 'propositional') but pictures by themselves do not (they are not decomposable into such elements). This raises the problem of indeterminacy: a picture is proverbially worth a thousand words, but from any image countless possible statements could be inferred.

Peirce insists that "what we usually mean by a proposition . . . is a symbolic proposition, or *symbol*" (CP 2.357; cf. CP 2.315; CP 5.76). "The proposition conveys definite information" (CP 5.76) and the communication of such information requires conventional symbolic form (CP 2.436; CP 2.291). His assertion that "icons and indices assert nothing" and that propositions are necessarily symbolic may initially appear to echo the classical distinction between 'natural' signs (such as pictures or footprints) and conventional, primarily symbolic signs (such as verbal language). However, Peirce's distinctive semiotic contribution was his argument that propositions are signs which are analytically decomposable into symbolic, iconic and indexical signs (EPII: 10; CP 5.553).² While the copula is a symbolic element (EPII: 20), every proposition (and assertion) needs at least one index and one icon, and indexicality and iconicity constitute the two ways in which a proposition refers to its object (CP 2.312; CP 2.319; CP 5.76; CP 6.338).

'We think only in signs', and concepts are the 'symbol-parts' of mental signs (EPII: 10); however, "a symbol, in itself. . . does not show what it is talking about. It needs to be connected with its object. For that purpose, an index is indispensable. No other kind of sign will answer the purpose" (CP 4.56; cf. CP 2.295; CP 2.287n; CP 3.363). Thus, without indices, symbols cannot "convey the slightest information" (EPII: 7). An index functions to identify the referential subject(s) of the proposition – the object which is denoted (CP 2.318; CP 2.336; CP 4.56; CP 8.41). It provides a contextual frame of reference (CP 2.369). "It does not follow that the subject of a proposition must literally be an index,

² Peirce's work was later to lead the linguist Roman Jakobson to emphasize that while all words are symbols, some can also function as icons and indices.

although it *indicates* the object of the representation in a manner like the mode of representation of an index” (EPII: 168; cf. CP 2.357). It is purely denotative (CP 5.429). Unlike the icon it points directly “to the particular object intended without describing it” (CP 1.369). It ‘asserts nothing’ (CP 3.361). A proposition requires an index to establish “a real relation to the fact” (CP 1.372; cf. CP 2.305; CP 4.448). The index refers to a real object “independent of the representation” (CP 2.315). Truth or falsity “can only be ultimately and directly assured by an index” (EPII: 461). However, “the only way in which any index can be a proposition is by involving an *icon*” which enables it to communicate some information (EPII: 319; cf. EPII: 310; EPII: 461). Thus, while it may not constitute a ‘statement’, as an iconic index a photograph can provide ‘a flood’ of factual information (EPII: 13), though it lacks rules for guiding its interpretation.

Regarding the predicate, “every assertion must contain an icon or set of icons, or else must contain signs whose meaning is only explicable by icons” (CP 2.278). While a proposition is abstract, an icon (though lacking the direct connection of an index) is based on some form of perceived resemblance (not necessarily visual). Syntactical form is itself iconic insofar as it is a kind of diagram of logical relations. An iconic representation (such as a diagram or an image) can function as a predicate by signifying some quality of the referent based on some similarity or analogy of form or relations (CP 2.278; CP 2.309; CP 2.316; CP 3.641; CP 4.448). In itself, “an image . . . carries no meaning. It simply exhibits itself and in doing that represents anything it resembles” (MS 693b: 100–102). The predicate excites an icon in the mind of its interpreter (CP 5.76; EPII: 172; MS 280). Indeed, “icons are specially requisite for reasoning” (CP 4.531), which “consists in the observation that where certain relations subsist certain others are found, and . . . accordingly requires the exhibition of the relations reasoned within an icon” (CP 3.363). Although an icon lacks “a rule that will determine its interpretant” (CP 2.292), which would require a symbol, it is “the only way of directly communicating an idea” (CP 2.278). “Icons may be of the greatest service in providing information” (for instance in geometry), “but . . . an icon cannot, of itself, convey information” (CP 2.314; cf. EPII: 7) because “it affords no assurance that there is any such thing in nature” (CP 4.447). Such assurance requires an index. Lacking the factuality of an index an icon cannot be true or false, and thus by itself it cannot be a proposition or even a quasi-proposition (a *dicisign*) (CP 2.314).

Thus, in Peirce’s semiotic formulation, “a proposition is the signification of a sign which represents that an icon is applicable to that which an index indicates” (MS 599). Peirce denied that there were any pure icons or indices (preferring on some occasions to refer to such signs as maps and signposts as *hypo-icons* and *hypo-indices* involving conventions). He argues that “in all

reasoning, we have to use a mixture of *likenesses*, *indices*, and *symbols*. We cannot dispense with any of them” (EPII: 10). Although “mental signs are of mixed nature”, he insists that the symbolic mode is dominant (*ibid.*; cf. CP 4.448). An icon can ‘excite an idea’ and an index can ‘record a fact’, but ‘to make a rational appeal’, “the only sort of sign that can possibly answer the purpose is that which represents its object by virtue of the disposition of the interpreter, – that is to say, a symbol” (EPII: 461). “A proposition is . . . a general description” but “neither *icon* nor *index* possesses generality” (CP 1.372); in order to assert, icons and indices require symbolic coordination. “A *symbol* is a sign naturally fit to declare that the set of objects which is denoted by whatever set of indices may be in certain ways attached to it is represented by an icon associated with it” (CP 2.295). “A proposition *asserts* something. That assertion is performed by the symbol” (CP 2.436), acting as “the assertoric element, the mental copula” (CP 2.341). This is a notable departure from traditional models, where the copula is embedded in the proposition rather than in its interpretation (CP 2.319; CP 2.328; CP 2.343; CP 2.354; CP 2.415; CP 3.621). Peirce insists that “the symbol is connected with its object by virtue of the symbol-using mind, without which no such connection would exist” (EPII: 9). In recognizing a proposition, “we cause an image, or *icon*, to be associated . . . with an object represented to us by an *index*. This act itself is represented in the proposition by a *symbol*, and the consciousness of it fulfills the function of a symbol in the judgment” (CP 2.435). In other words, “the symbol is the mental act” of assertion (CP 2.436).

Neither the predicate, nor the subjects, nor both together, can make an *assertion*. The assertion represents a compulsion which experience . . . brings upon the deliverer to attach the predicate to the subjects as a sign of them taken in a particular way. . . It is . . . a permanent conditional force, or *law*. The deliverer thus requires a kind of sign which shall signify a law that to objects of indices an icon appertains as sign of them in a given way. Such a sign has been called a *symbol*. It is the *copula* of the assertion. (CP 3.435).

Peirce notes that a proposition is a proposition “whether it be true or not, whether anybody asserts it or not, and whether anybody assents to it to not” (CP 2.315). Elsewhere, he adds that “it is . . . quite impossible that a proposition should assert its own truth” (EPII: 169), and that “a *proposition*. . . is not an assertion, but is a sign *capable* of being asserted” (CP 8.337; cf. CP 2.252). He adds that, according to some definitions, “if assertion, or at any rate, assent, were omitted, the proposition would be indistinguishable from a compound general term” – so, for example, “A man is tall” would be reduced to “A tall man” (CP 2.321). Peirce thus makes an important distinction “between the *proposition* and the *assertion* of that proposition” (CP 5.543) – between the assertoric force of an utterance and its propositional content. A proposition can be

“affirmed, denied, judged, doubted, inwardly inquired into, put as a question, wished” (EPII: 312). Asserting a proposition is a speech act in which the assertor seeks “to make the intended interpreter believe what is asserted” (CP 5.546) and takes responsibility for its truth (CP 2.252; CP 5.543; cf. CP 2.335; CP 8.337; EPII: 313). Peirce refers to the performance of ‘an act of assertion’ and ‘an act of assent’ but he insists that “in performing either of these acts, the proposition is recognized as being a proposition whether the act be performed or not” (CP 2.315; cf. CP 3.433).

Peirce was certainly not logocentric: he observed, for instance, that “I do not . . . regard the usages of language as forming a satisfactory basis for logical doctrine” (EPII: 309). After 1901, his semiotic reformulation of the proposition opened up new ways of contextualizing propositional syntax. Photographs could be said to have a propositional structure insofar as they combine indexicality with iconicity. On one occasion Peirce suggested that as a photograph is the product of the rays of light from a known object in the world, a photographic print can be seen as a *quasi-predicate* and the light as the factual *quasi-subject*, and that this connection constitutes a syntax giving the photograph the status of a *quasi-proposition*. Indeed, he added that “every informational sign thus involves a fact, which is its syntax” (CP 2.320). Elsewhere, he argued that:

A weathercock . . . is fit to be taken as an index of the wind for the reason that it is physically connected with the wind. A weathercock conveys information; but it does this because in facing the very quarter from which the wind blows, it resembles the wind in this respect, and thus has an icon connected with it . . . While neither pure icon nor a pure index can assert anything, an index which forces something to be an *icon*, as a weathercock does, or which forces us to regard it as an *icon*, as the legend under a portrait does, does make an assertion, and forms a *proposition*. (EPII: 306–7).

Peirce claims that a portrait with an appropriate caption “is a proposition asserting that so that original looked” (CP 2.357), and is true or false to the extent that anybody who looks at it “can form a reasonably correct idea of how the original looked” (CP 5.569). Such examples demonstrate that (framed within familiar contexts) propositional syntax need not be confined to language (CP 2.320). This, he declares, “suggests the true definition of a proposition” as “a sign which separately, or independently, indicates its object” (EPII: 306–7; cf. CP 5.569; CP 2.357; CP 2.320). After all, in his multimodal semiotic model, a proposition itself “merely represents an image with a label or pointer attached to it” (CP 5.543), which becomes a sign only “by virtue of its receiving an interpretation” (CP 5.569). “If this broad definition of a proposition be accepted”, he adds, “a proposition need not be a symbol” (CP 2.357). He declares that “a *proposition* is a sign which distinctly indicates the object which it denotes,

called its *subject*, but leaves its interpretant to be what it may” (CP 2.276). Thus, however indeterminate, representational pictures have the potential to offer propositional content. Peirce’s astonishingly innovative propositional theory opened the door to *use theory*, according to which no signs – arguably not even declarative sentences – assert propositions in and of themselves, but any sign – including pictures – may be *used* to do so.

Nathan Houser¹

22 Bohemians, Like Me

No general description of the mode of advance of human knowledge can be just which leaves out of account the social aspect of knowledge. That is of its very essence. What a thing society is! The workingman, with his trades union, knows that. Men and women moving in polite society understand it still better. But Bohemians, like me, whose work is done in solitude, are apt to forget that not only is a man as a whole little better than a brute in solitude, but also that everything that bears an important meaning to him must receive its interpretation from social considerations. (Fragment R 1573.273, L 484 s.d.).

This quotation is an orphan among Peirce's writings with its import unconstrained by a definitive textual context; that allows for a ranging breadth of interpretation which gives it an unusual richness of meaning. Peirce penned these lines on a single page, possibly as a vagabond thought but probably as part of some larger compositional undertaking. In the collection of Peirce's papers in the Houghton Library at Harvard University, this page is included in a folder of fragments,² but with the continuing organizational work by the editors at the Peirce Edition Project, along with the spreading study of Peirce's manuscripts throughout the international world of Peirce scholarship, we may hope that one day this interesting page will find its proper place. At this point, given the appearance of Peirce's script and the type of paper on which he wrote, it seems likely that this text was written in the early years of the 1890s, perhaps in 1892 or 1893 in conjunction with his developing thoughts on fallibilism.³ But given the uncertainty about the composition of this text, we are free to speculate freely about its significance.

Of course some of the themes suggested here are well-known motifs in Peirce's writings, considered as a whole. In particular, we recognize the claims that there is a crucial social aspect to knowledge and that there is an essential link between meaning and interpretation as core Peircean ideas. Joseph Ransdell and Torkild Thellefsen have each used this quotation to illustrate Peirce's doctrine that knowledge is essentially social.⁴ But what I like in particular about the quotation is that it seems to temper any overly-enthusiastic claim for the

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² It is now in fragment folder R 1573.273 (but there is a copy also in L 484).

³ The text is written on the same type of paper Peirce used for several writings of the 1892–93 period (R 862, 936, 954, and 955) which were all related to his developing fallibilism.

⁴ See, especially, Thellefsen's "The Fundamental Sign" in *Semiotica* 149-1/4 (2004): 245–59. It should be noted that Peirce, himself, pointedly emphasized the importance of the social element in his thought. On 1 April 1893, he wrote to Edward C. Hegeler: "The recognition of the

social character of knowledge and that it expresses so well a tension that runs throughout Peirce's life and work. Peirce recognized from early on that he was intrinsically a social being yet he was always a man apart and he became more-so as he aged. Also, while he understood from the start that intellectual achievement must be the outcome of a communal effort, yet for much of his life he worked at the fringes of the intellectual life of his time. Even while Peirce decried an overblown emphasis on the importance of the individual he extolled great men and women as crucial for the advancement of civilization. I see in this quotation evidence of this tension in Peirce's self-conception. There is also an interesting sociological tone to the quotation and some political overtones which suggest that Peirce was more in tune with the tenor of his times than he is often thought to have been. If Peirce penned these words during the first half of the 1890s, as I'm guessing he did, it was in the waning years of the Gilded Age during one of Peirce's rather intense anti-capitalism phases, a time when labor unrest was pervasive throughout the U.S. and the economy was heading into serious crisis. Peirce predicted that historians of the future would think of the 19th century as "the economical century", in honor of the rise of the science of political economy, and he expressed the economists' "formula of redemption" acerbically: "Intelligence in the service of greed ensures the justest prices, the fairest contracts, the most enlightened conduct of all the dealings between men, and leads to the *summum bonum*, food in plenty and perfect comfort. Food for whom? Why, for the greedy master of intelligence".⁵

What seems, though, to first jump out of this quotation is Peirce's identification of himself as a bohemian. What did he mean by this? It was common in the 19th century to think of impoverished writers as bohemians and after the U.S. Civil War, the term "bohemian" came to mean "newspaper writer",⁶ so given the material poverty that Peirce suffered in his later years and his dependence on his newspaper and magazine writing for his "bread and butter", he may just automatically have put himself in the bohemian camp. After labeling himself a bohemian he noted that his work was done in solitude, which seems to have

social element in philosophy, – the exhibition of it in psychology, in logic, and in metaphysics, – the tracing out its connections and the conditions of its development, – in short, the reconciliation of the I and the IT through the THOU, – that will be the direction in which I shall be of service to mankind, if I prove of any service; and that I have kept steadily in view for the more than 30 years I have been working in philosophy". (Peirce's letter to Hegeler is in the Open Court collection in the Morris Library at Southern Illinois University).

⁵ W8: 186. See my introduction to W8 for some discussion of this anti-capitalism theme in Peirce work during this period. The unabridged version is available at the Arisbe website: www.cspeirce.com.

⁶ See n. 6 to the 23 April 1867 letter from Mark Twain to Charles Warren Stoddard, Mark Twain Papers, California Digital Library, where reference is made to Junius Henri Browne's *The Great Metropolis; A Mirror of New York*. Hartford: American Publishing Company, 1869: 151–52.

been what he was stressing, but working in solitude did not mark one a bohemian, as Peirce would have understood. We know that he was intimately familiar with the definitions in the *Century Dictionary and Cyclopedia* so we might guess that his idea of bohemianism would have coincided with what was said there. The most relevant *Century* definition is: 4. A person, especially an artist or a literary man, who leads a free and often somewhat dissipated life, having little regard to what society he frequents, and despising conventionalities generally.⁷

While others may have seen Peirce in this way, I doubt that he thought of himself as dissipated or as despising of conventionalities but it is true that he exhibited a great indifference, if not alienation, to social conventions. Already in 1877 in his famous essay, “Fixation of Belief”, when discussing the method of authority, he asserted that “those who wield the various forms of organized force in the state will never be convinced that dangerous reasoning ought not to be suppressed in some way” and that unless some grosser form of constraint is employed, the “uniformity of opinion will be secured by a moral terrorism to which the respectability of society will give its thorough approval”. He went on to say that “wherever you are, let it be known that you seriously hold a tabooed belief, and you may be perfectly sure of being treated with a cruelty less brutal but more refined than hunting you like a wolf”. Peirce then made a claim that is suggestive of the esoteric philosophy of Leo Strauss: “Thus, the greatest intellectual benefactors of mankind have never dared, and dare not now, to utter the whole of their thought . . .” (W3: 255–56). After his divorce from Melusina and his marriage to Juliette in 1883, and after his dismissal from Johns Hopkins University the following year, he and Juliette began to associate more and more with the New York bohemian crowd – their close friends including playwright and director Steel Mackaye and his wife Mary, writer Titus Munson Coan, poet Edmund Clarence Stedman, and artists Albert Bierstadt and George B. Butler – and it is clear that Peirce increasingly came to regard himself as living outside of polite society.⁸ By 1890, he began writing newspaper articles using the pseudonym “Outsider”, probably because that is what he felt he had become, but as the years passed by any ill-will he may have felt about his marginalization seems to have dissolved; in 1903, writing to W. R. Thayer, the editor of the

⁷ According to the *Century Dictionary*, Gypsies are sometimes called Bohemians. This is of interest because Peirce’s second wife, Juliette, is thought by some to have been of Gypsy origin and that Peirce seemed to have a particular interest in Gypsy culture: see Peirce’s “Embroidered Thessaly” (W8: sel. 51) and K. Ketner’s *His Glassy Essence*. Nashville: Vanderbilt University Press, 1998. 280–91. At the conclusion of “Embroidered Thessaly”, Peirce’s alter-ego, Karolos, buys a remarkable but bizarre house in Prague, a house built to imitate some of the chambers of the Alhambra, and he then traveled to Vienna where, in Klephtic costume, he abducted Roshaná (with her prior consent) and transported her by train to his Bohemian mansion.

⁸ See Introduction to W6: xxxviii–xxxix.

Harvard Graduates' Magazine, Peirce wrote that he was “the last person in the world to know about social ostracism for I have never belonged to society myself nor been able to conceive what any student should be doing there . . .”⁹

Of course one does not have the privilege of defining oneself, as Peirce understood and made clear with his identification of man with an external sign.¹⁰ So we may assume that Peirce could not help but regard himself to some extent as others regarded him. It is interesting that William James, who knew Peirce perhaps as well as anyone outside of Peirce's own family, saw Peirce much as he saw himself. In April 1894, James wrote to George Howison at Berkeley (probably dashing any chance Peirce may have had for an appointment to the philosophy faculty there):

As for Charles Peirce, it's the most curious instance of talents not making a career. He dished himself at Harvard by inspiring dislike in Eliot. . . . He is not so mature in character, with rather fixed half-bohemian habits, and no habit of teaching, that it would be risky to appoint him. I yield to no one in admiration of his genius, but he is paradoxical and unsociable of intellect, and hates to make connection with anyone he is with. With all this curious misanthropy, he has a genuine vein of sentiment and softness running through him, but so narrow a vein that it always surprises me when I meet it. Anyhow he's a genius, and I look forward with avidity to his work.¹¹

Following James, many others have noted the bohemian streak in Peirce's character.¹² Abraham Roback described Peirce as “a typical bohemian, an individualist with erratic tendencies”.¹³ According to Thomas S. Knight, “There are reasons for believing Peirce to have been a conceited, half-bohemian, mercurial snob who was too outspoken and honest to be tolerated in polite society”.¹⁴ H.O. Mounce says that:

9 Peirce to W. R. Thayer, 27 Nov. 1903. Quoted in Charles S. Peirce: A Medical History. M. H. Fisch and D. Pfeifer, unpublished, 2010: 156.

10 For some development of the idea of Peirce as an external sign see my paper, Peirce as a Sign to Himself, in John Deely & Leonard Sbrocchi (eds.), *Semiotics 2008*, 387–95. Legas Publishing.

11 Ralph Barton Perry. 1935. *The Thought and Character of William James*, Vol. II. Boston: Little, Brown, & Co: 117.

12 It is worth noting that some cultural historians see a close connection between the rise of pragmatism in the US and the development of bohemianism. According to Ruth C. Crocker, the attitudes we associate with the “Bohemian culture and modernism” began with the members of the Harvard Metaphysical Club, the prominent original members having been Peirce and, of course, James himself. Along with Peirce and James, Crocker includes Dewey and Mead, who, while not members of the Metaphysical Club, contributed fundamentally to the pragmatist ethos. See Crocker 2007. *Cultural and Intellectual Life in the Gilded Age*. In Charles Calhoun (ed.), *The Gilded Age: Essays on the Origins of Modern America*, 211–35. Lanham, MD: Rowman & Littlefield Publishers.

13 Abraham Aaron Roback. 1957. *Personality in Theory and Practice*. London: Owen, 437.

14 Thomas S. Knight. 1965. *Charles Peirce*. New York: Washington Square Press, 2.

Peirce exhibited in his life the sort of disorder which one associates more readily with an artist of the Romantic or Bohemian period than with a philosopher and scientist ... Many thought him arrogant and contentious, he had difficulty in submitting to authority, his lifestyle was thought extravagant or unconventional, and there were rumors of drug addiction and alcoholism. He had no head for practical affairs.¹⁵

But in the only full-scale biography of Peirce to appear so far, Joseph Brent, surprisingly, chose to represent Peirce as a Baudelairean dandy. This is surprising because, typically, a dandy is thought to have a dramatically different attitude toward society than a bohemian has. According to Victor Allen Crawford (under his pseudonym, Lord Breaulove Swells Whimsy), “Bohemianism strives to be more chaotic and less restrained than the status quo, but dandyism concerns itself with the opposite, becoming as poised, self-contained, and rarified as its circumstances will allow. In other words, bohemianism ignores rules that mainstream society cannot afford to disregard, whereas dandyism obeys rules that mainstream society cannot afford to observe”.¹⁶ But not everyone considers dandyism and bohemianism to be discrepant; David Brooks, for example, regards dandyism as “a strain of bohemianism” that came and went in the 19th century.¹⁷ This seems closer to Brent’s view. In comparing Peirce with Baudelaire, Brent writes that both men “were social outcasts” and both were

bohemians and were ... disgusted and dismayed by the bourgeois culture that surrounded them ... Both men were forced by their ostracisms to make their livings by their wits and from writing articles for journals, and both lived their last years on the charity of others.¹⁸

But Brent goes on to describe Baudelaire’s ideal of the dandy as “the modern heroic individual” with the ambition “to be a great man and a saint by *one’s own standards*, that is all that matters”¹⁹ Brent accepts that this is also Peirce’s ideal but this is where I part ways with him. Rather than saying, with Baudelaire, that to be a great man and a saint by one’s own standards is all that matters, I believe that Peirce would have said that it hardly matters at all. I think that my

¹⁵ H.O. Mounce. 1997. *The Two Pragmatisms: from Peirce to Rorty*. London and New York: Routledge, 3–4.

¹⁶ *The Affected Provincial’s Companion*. 2004. New York and London: Bloomsbury, 4.

¹⁷ This is according to David Willoughby from his article “What is a Dandy?” in *The Rugged Gentleman* (www.theruggedgent.com), July 17, 2011. His reference is to David Brooks book, *Bobos in Paradise: The New Upper Class and How They Got There*. New York: Simon & Schuster, 2000.

¹⁸ Joseph Brent, *C. S. Peirce; a Life*. Bloomington and Indianapolis: Indiana University Press, revised ed., 1998, 22.

¹⁹ *Ibid*, p. 23; here Brent quotes Baudelaire from *Intimate Journals*, tr. C. Isherwood. London: Panther Books, 1969, 76.

disagreement with Brent on this question of the importance of the individual qua individual points to the tension in Peirce's life and thought evidenced in our enigmatic opening quotation: "But Bohemians, like me, whose work is done in solitude, are apt to forget that not only is a man as a whole little better than a brute in solitude, but also that everything that bears an important meaning to him must receive its interpretation from social considerations".

The tension I see implicit in the quotation is one that others who study Peirce's life and work frequently remark on. Mounce says of Peirce that his "work stands to his life in poignant and mysterious contrast . . . the sense of order, which was lacking in his life, is everywhere expressed and celebrated in his work".²⁰ I believe that one of the clearest expressions of this tension is found in John Patrick Diggins' landmark book, *The Promise of Pragmatism*:

When considering Peirce's personality together with his philosophy, the curious thing about his life-style was not that it was indulgent but that it was inconsistent. . . . Pragmatism purports to reconcile theory and practice by making the latter the test of genuine ideas. Yet in the case of Peirce, theory and practice, his philosophical stance and his actual life, often stood in conflict. Although he regarded individualism as America's greatest curse, he himself lived and died an individual cloistered in his study in a remote house in Milford, Pennsylvania. Although he believed that the highest expression of science lay in the cooperative spirit and mutual interrogation carried on by a "community of inquirers", he did his greatest work as a solitary thinker impatient with the limitations of others".²¹

Whether or not Diggins has identified real inconsistencies in Peirce's life and thought, strictly speaking, is open to debate, but I think he has located the tension that was troubling Peirce. If the social aspect is fundamental for human knowledge and if society is necessary for humans to thrive, how could Peirce, as a social outsider, and in his later years a virtual recluse, hope to contribute to the advancement of thought?

Although I am convinced that Peirce was right to insist on the social core of knowledge and meaning and that to contribute to the advance of knowledge one really does have to engage with a developing current of ideas that is a community endeavor, he could not really have supposed that his ideas were so disconnected from an intellectual community that they amounted to little more than the ruminations of a brute. His core intellect had been formed in constant engagement with a wide community of investigation and even in his later years, when he lived in relative isolation, he continued to correspond with select intellectual companions and, more importantly perhaps, to engage with the vast

²⁰ Mounce 1997: 4–5.

²¹ John Patrick Diggins. 1994. *The Promise of Pragmatism: Modernism and the Crisis of Knowledge and Authority*. Chicago and London: University of Chicago Press, 160–62.

community of thought that found expression in the considerable library that was always within his reach. As Peirce himself remarked, “Seldom do we pass a single hour of our waking lives away from the companionship of men (including books); and even the thoughts of that solitary hour are filled with ideas which have grown in society” (CP 6.437). Of course the current of meaningful thought is a forward moving current, so however engaged Peirce may have been with his colleagues from the past, it was important for him to remind himself that for his own work to contribute to the advance of human knowledge the social considerations necessary for the interpretation of his writings were those of his own time or of the future. I think this is part of the thrust of the opening quotation.

But Peirce’s text carries a hidden meaning, one that he may have felt without articulating it – even though it is implicit in his thought overall. The power of ideas to effect change of any kind comes from individuals who comprehend those ideas and put them to use. The introduction of an idea into the intellectual current of the times is an action requiring social engagement with living members of the ongoing community of research. It is not enough to *have* good new ideas, even if those ideas cohere well within the context of the ongoing current of research. For the new ideas to count, to really play a part in the development of knowledge, an individual of power has to step forward to promote them and to persuade the community to *use* them, or at least to give them fair consideration. Peirce’s lifelong fascination with great men and women shows that he understood this. While it is true that to contribute to the advancement of knowledge, one must merge one’s interests with those of the ongoing research community, and even be prepared to embrace personal defeat as a step forward for the community as a whole, yet as Peirce was keen to point out, it is the individual man or woman who makes the difference along the way: “lofty results require for their attainment lofty thinkers of original power and individual value. You cannot silence or stifle or starve a single one of them without a loss of civilization from which it never can wholly recover” (CP 7.275).²² The message of Peirce’s text, in the opening quotation, may be that to live in isolation from the community one hopes to influence is to lose the existential power to do so.

²² I discuss this theme in Peirce’s *Neglected Views on the Importance of the Individual for the Advancement of Civilization*. *Cognitio; Revista de Filosofia* 14.2 (2013): 163–77.

James Jakób Liszka¹

23 Peirce's Evolutionary Thought

I now found myself forced by a great many different indications to the conclusion that an evolutionary philosophy of some kind must be accepted ... (CP 6.604, 1893).

Darwin's theory of evolution (1859) not only revolutionized biological science in the 19th century, but generated an enormous social and cultural challenge in the way we think of ourselves. The impact on America at that time was particularly notable. As Charles Peirce viewed it, the "modern recognition of evolution" and "modern science had put us into quite another world, almost as much as if it had transported our race to another planet" (CP 5.513). Peirce responded to both the scientific, social, and metaphysical implications of Darwin's theory with an evolutionary philosophy that, while affirming Darwin, avoided a mechanistic worldview, and incorporated a notion of teleology that did not infer a dualistic theism.

The Historical Context of Peirce's Theories

In popular and religious thinking in the 19th century, Darwin's theory contradicted the idea of special creation and, much like the Copernican Revolution, threatened to displace human beings as the center of value in the cosmos. To suggest that chance variation was the source of our coming-into-being, was to infer that the cosmic order lacked intelligence and, hence, a divine architect. As today, popular preachers in the 1870s, led much of this charge against Darwin (Webb 1994: 48). As predicted by Darwin himself, several of the scientific elders in America, such as the venerable Louis Agassiz, rejected Darwin's theories and the hypothesis of the mutability of species. However, the younger generation of biologists, such as Asa Gray, James Dana, Jeffries Wyman, and Joseph Leidy, took on the new hypothesis with enthusiasm. By 1873, the hypothesis was no longer much disputed in the American scientific community (Metzger 1955: 48), even if it was in dispute or diplomatically tolerated by college presidents and administrators.

One thesis of Darwin's theory – that the development of the species was accomplished through chance variation – seemed, in particular, to generate fears

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and anxieties among those in the religious community who understood its implication. Such a view led to the conclusion that the cosmos lacked any pre-ordained order, any overarching teleology, and was not guided by any supreme intelligence. Even if Darwin or any of his followers denied or equivocated about it, this promoted the possibility of a godless universe—a view widely disseminated by many theologians, such as Enoch Fitch Burr, among others, who proclaimed that evolution was “founded by atheism, claimed by atheism, supported by atheism, used exclusively in the interest of atheism” (quoted in Webb 1994: 17). Agassiz recognized this, and proclaimed that the theory rejected the most basic feature of the natural world, “the unmistakable evidence of thought”. Thought, in turn, could only be explained as the product of intelligence and, thus, a guiding intelligence in nature (Agassiz 1989: 17).

Without the security of a well-established notion of academic freedom, American institutions of higher learning were particularly affected by Darwin's thought and its controversies. Many professors suffered dismissal and harassment even for qualified support of Darwin. It is interesting to note that Edward Youmans, founder and editor of *The Popular Science Monthly* – and who published Peirce's series on pragmatism – used his publication as a vehicle for defending those academics, such as Alexander Winchell at Vanderbilt (Youmans 1878; cited in Webb 1994: 35). University presidents and administrators had to tread lightly around this issue in order to avoid controversy. A case in point was the newly founded Johns Hopkins University, whose president, Daniel Gilman, had appointed Charles Peirce among the first faculty for the institution. He walked a fine line in regard to evolution. On the one hand, Gilman appointed Newell Martin, a disciple of Huxley, as professor biology, and invited Huxley himself to the university campus, but any hint of advocacy of materialism or atheism among his faculty was not tolerated.

Several scientists attempted to reconcile Darwin's theory with theism. Asa Gray's “Evolutionary Teleology”, published in *Darwiniana* in 1876, argued that natural selection was essentially an efficient cause of an intelligent design which, as a final cause, expressed a disposition toward avoidance of imperfections and failure and a tendency toward successes. A neo-Lamarckian theory also began to develop at this time, supported most notably by two students of Louis Agassiz, Alpheus Hyatt and Alpheus Packard, who founded the journal, *American Naturalist*, as the editorial arm of the movement (Webb 1994: 24). Although the neo-Lamarckians argued for the transmutation of species, they believed that natural selection and chance variation were not its mechanism; instead, inheritance of acquired characteristics was the principal mechanism of evolution in organisms (Moore 1979: 146). Edward Cope was considered the best among this group (1896).

However, in the 1880s, August Weismann's "germ plasm" theory changed scientific thinking in favor of Darwinism and against the neo-Lamarckians. He provided substantial evidence that inherited traits passed only through germ cells of the body, that is, egg and sperm cells, and not through somatic cells. Germ cells produce somatic cells and other germ cells, but are not affected by somatic cells. In that case, no changes produced by the action of the environment on the somatic cells could be transmitted through heredity. If inheritance of acquired characteristics was impossible, then Lamarckism failed. By the turn of the century, Lamarckism had lost any significant support among biologists. Peirce was certainly aware of Weismann's findings (CP 1.105; CP 6.298).

Another stream of thought that entered into the mix of cultural antagonism surrounding Darwin's theory was social Darwinism. It was something that resonated with capitalists and libertarians in the "Gilded Age" of America. The movement was initiated by Herbert Spencer, who advocated a *laissez-faire* policy toward government and society, which would force individuals to become fit, and generate the greater good of society in general. It was the sociologist, William Sumner, however, who was its strongest champion. (Sumner 1883; see also Hofstadter 1992: 51). For him, capital was the coin of the realm so to speak, and those who accumulated capital were serving society by bolstering the underpinnings of the form of government that was most conducive to the accumulation of capital (see Webb 1994: 39). In "Evolutionary Love", Peirce obliquely places his nemesis, Simon Newcomb, in this category.

Peirce's Cosmology and Teleology

Like many philosophers of his time, Peirce was fully aware of these various controversies concerning Darwin, and attempted to address the import of the evolutionary theory. Above all, Peirce was a strong advocate for science, and sensed its growing importance in the 19th century. Indeed, his pragmatic maxim is modeled on hypothesis testing in the laboratory, his metaphysics is informed by the scientific theories of the day, and his social thought is based on a model of the scientific community. His own work in astronomy and pendulums had given him powerful experience as a scientist, and he was well adept in the physics of his day. His mathematical credentials were impeccable, having been trained by his father, the greatest mathematician of his time.

The body of his work suggests something of a tension in his consideration of religion, on the other hand. He strove mightily to refute materialism, primarily because he believed it entailed a mechanical view of the world – which he

totally rejected. At the same time, he did not jump into the welcoming arms of the metaphysical dualism of a theistic position. He seemed to genuinely believe in the existence of God in some sense of the term, and seemed sympathetic to the basic tenets of Christianity. However, he had a strong sense of the tension between science and religion.

In a short essay, “The Marriage of Religion and Science”, published in 1893, in the *Open Court* (7: 359–60), he argues that the essence of science is an effort at continuous growth toward the perfection of knowledge. Religion, on the other hand, suffers a life cycle: it grows, reaches a peak, and then decays (CP 6.430). In general the “spirit of science is hostile to religion” (CP 6.426). The antagonism between science and religion arises when – as religion makes its propositions known – science refutes them (CP 6.431). Darwin’s evolutionary theory, of course, is the prime example of the tension between science and religion in the 19th century. Peirce concludes by arguing that the marriage between science and religion is found in a “religion of science”, that is, an acceptance of the scientific spirit of pursuit of truth.

As a scientist, Peirce was convinced of the scientific credibility of Darwin’s theory. But for him it inspired a thorough-going consideration of evolution metaphysically, epistemologically, and cosmologically. He found himself “forced”, as he said, “by a great many different indications to the conclusion that an evolutionary philosophy of some kind must be accepted” (CP 6.604). Emphatically, he states that “philosophy requires thorough-going evolutionism or none” (CP 6.14). In this effort, he understood very well the social, cultural, and religious implications of Darwin’s theory of evolution, its scientific controversies, the thoughts of the social Darwinists and the social Gospel, the arguments of Lamarckism, and its apparent refutation by Weismann. Into this swirling pot of thought, Peirce hoped to introduce some order.

In 1891 Peirce had his chance, and was invited by Paul Carus to write a series of five articles on metaphysics and cosmology for the inaugural edition of the *The Monist*. Peirce was introduced to Carus by Judge Francis Russell of Chicago, and Carus seemed impressed by his intellect and ability. During a three year period, 1891–1893, Peirce wrote five articles, outlining the basics of his evolutionary philosophy. The pieces included the “Architecture of Theories”, “The Doctrine of Necessity Examined”, “The Law of Mind”, “Man’s Glassy Essence”, and “Evolutionary Love”. Although a full understanding of Peirce’s evolutionism has to draw on other sources, the core of Peirce’s evolutionary philosophy is contained here. Although the articles often contain some brilliant insights, they are not Peirce at his best. They leave the reader with the impression of an unfinished work, sketchy and chatty in parts, with spurts of speculation, technical diversions into mathematics, and claims that something “has been demon-

strated" elsewhere when, in fact, no such thing had occurred. Nonetheless, a helpful analysis of these pieces can present the best side of his evolutionary thought.

To Peirce, Darwin's account of evolution was not the problem – it was a purely mechanistic view of the world that Peirce aimed to discredit, and to preserve some sort of teleological picture of the world. Indeed, Paul Carus remarked that these “Two World Conceptions stand in a strongly marked contrast to one another. One is the mechanistic, the other is the teleological, and the struggle between the two is quite severe” (1913: 1). In attacking the mechanical worldview, Peirce hoped to disassemble the last vestige of Cartesianism. In his first essays in *Popular Science Monthly* in the 1870s, he had hoped to disabuse philosophers of a number of Cartesian principles: instead of the certainty of first principles, Peirce advocated a fallibilism: instead of the “paper doubt” of Descartes, he stood on the ground of common sense, and promoted a critical version of it; instead of a grounding in the direct intuition of innate ideas, Peirce promoted the idea of an indefinite process of semiosis, interpretation, and mediation; instead of clear and distinct ideas, a pragmatic account of how to make ideas clear; instead of deduction as the principal form of reasoning, statistical induction, and instead of inquiry as individual insight and effort, inquiry as a communal and generational process. Now he was intent on debunking Descartes's mechanistic picture of the world, with the artificial dualisms it entailed.

For Peirce, there was only one solution to counter this mechanist world view that many scientists had also come to accept, and to counter the dualisms between mind and body, purpose and order, matter and intelligence it entailed. As science dismissed more and more of the grounds for accepting an ontological notion of the immaterial, Peirce saw clearly that the Cartesian worldview left the scientist with only a materialist worldview – which, in his mind, meant a mechanistic metaphysics. If Peirce was to advocate a monism as an alternative to Descartes's dualism, it could not be in favor of a mechanistic materialism, nor could it be the unpalatable alternative of the immaterialism of Berkeley (see Hausman 1993: 147ff, 173ff). If he was to counter mechanism with teleology, and suggest that the order of the cosmos embodied some form of intelligence, it could not be of an exogenous sort, since that implied a dualism as well. Peirce's solution was to propose what he called an “objective idealism”, the idea that the material order of things had an immanent intelligence, manifested as a tendency to take on habits that ultimately exhibited a directedness, hence a teleology of a sort (CP 6.24). For Peirce rather than viewing mind as a separate ontological order from the material world, mind could be seen as present all the way down – the ordering of matter itself exhibited intelligence of a certain sort, that it was just mind with such “indurated habits as to cause it to act with a

peculiarly high degree of mechanical regularity, or routine” (CP 6.277). If the “law of mind” was simply understood as the tendency of phenomena to take on habits (i.e., patterns with variations), and a tendency toward generalization, then there was no reason, in principle, why one could not see the cosmos infused with mind-like order (CP 6.104; CP 6.152).

Although all of this is a means of going between the horns of the dilemma that dualism and mechanism presented, Peirce had to show that such metaphysical and cosmological positions were plausible – not only plausible in a speculative sense, but also in a scientific sense. Peirce makes such an effort in *The Monist* series.

In the first four essays, using Pierre LaPlace as a foil, Peirce attempts to debunk a mechanistic worldview. As Peirce defines it, a mechanistic system was one whose processes consistently produced the same outcome by the same means. Thus, it was completely deterministic and predictable (CP 6.37).

Collectively, Peirce’s argument has three principal points. First, Peirce anticipates key concepts in complex systems, and recognizes that there are inherently indeterminate systems that are sensitive to minute changes in initial conditions and, thus, difficult to predict: “it is the characteristic of unstable equilibrium that near that point excessively minute causes may produce startlingly large effects” (CP 6. 264). Second, Peirce argues that chance, hence indeterminacy, is a fact of the universe, and necessary for the possibility of any form of evolution and development (CP 6.64). If the world were a perfect mechanism, it would not change, develop, alter, or evolve away from that mechanism. Third, there is positive scientific evidence for the existence of teleology, understood in a particular sense of that term.

The last argument rests on a three-legged stool. First, Peirce wants to show that not only does chance and indeterminacy exist but that “chance begets order”, (CP 6.297). Chance is manifested, according to Peirce, as a distribution of features or events (CP 6.74). The first leg on the stool is what we call today the central limit theorem – or what Peirce called “the statistical method” (CP 6.297; 1889: 4741) – which demonstrated that orderly normal distributions of features or outcomes are the results of random sampling in the long run. Second, the Second Law of Thermodynamics which, in Peirce’s thinking, was a statistical law, was a premier example of how random interactions among gas particles leads toward uniform distribution or entropy in the long run. Darwin’s theory of evolution, for Peirce, was the third leg of the three-legged stool, since it demonstrated that chance variations of a species, filtered through natural selection would lead to adaptive species. All three processes showed how chance events tended toward certain relatively fixed ends, processes which Peirce labeled elsewhere as *finious* (CP 7.471). In general, finious processes, such

as many non-conservative physical forces, demonstrate asymmetry, irreversibility, and directedness. As such they exhibit final causes of a sort, hence, a teleology in Peirce's sense of the term:

We must understand by final causation that mode of bringing facts about according to which a general description of result is made to come about, quite irrespective of any compulsion for it to come about in this or that particular way; although the means may be adapted to the end. . . . Final causation does not determine in what particular way it is to be brought about, but only the result shall have a certain general character (CP 1.211).

Since mechanistic systems produce the same ends by the same means, the fact that these key finious processes demonstrate that chance events provide a variety of means to achieve a relatively fixed end, provides evidence for teleological processes inherent in the order of things (see Short 2007: 126). The central limit theorem demonstrates that chance events will eventually describe a normal distribution in the long run; the second law demonstrates that random interactions of gas particles will describe a distribution of the Maxwell-Boltzmann type, and Darwin's theory demonstrated that chance variations in organisms tend toward optimal adaptation to the environment, that is, a certain distribution of variations in and among species.

With these three legs of the stool, Peirce seemed satisfied that there was a basic teleological character to the order of things, and one that could be scientifically based, rather than religiously grounded. However, this teleological character was endogenous to processes, rather than exogenous. What is these days called "intelligent design" would only invoke another dualism in Peirce's view, leaving a mechanistic nature governed by an immaterial intelligence. In the end, Peirce's conclusion was that "a tendency toward ends is so necessary a constituent of the universe that the mere action of chance upon innumerable atoms has an inevitable teleological result" (CP 8.44).

In the fifth essay, "Evolutionary Love", Peirce tackles the issue of cultural evolution. Peirce outlines three types of evolution. *Tychistic* evolution is illustrated by Darwin's theory, where chance is the primary operative in the process (CP 6.296). *Anacastic* evolution, on the other hand, is evolution by catastrophe or regime change, which allows for the growth of surviving elements or formations (CP 6.298). The third is illustrated by Lamarckism, and is evolution by adoption of habits and intentional efforts, which he labels *agapistic* (CP 6.299). For Peirce, it is likely that all three have played a role in biological evolution, notwithstanding Weismann's evidence (CP 1.105); but certainly all three play a role in cultural evolution, and he provides various illustrations from measurement standards to scientific thought (CP 1.105–106). But there is good reason to think that Lamarckian forms of evolution play a dominant role. Even Darwin,

particularly in *The Descent of Man*, appears to argue that natural selection becomes a subordinate factor in evolution with the advent of culture of civilization. For Darwin, however, there was no guarantee of progress, particularly moral progress, which had too many variables to consider as inevitable (Darwin 1874: 140–143). It was the inheritance of characters acquired through habit, thought, and instruction that was more important for the development of the higher parts of man's nature (Darwin 1874: 143, 618).

Peirce's point seems to be something that is debated currently in the literature that, if Darwinian evolution is not the only form of evolution, it does not necessarily provide the model for cultural evolution (see Kronfelder 2007). If Lamarckian-types of evolution are a significant part of cultural evolution, understood rightly, they have much of the characteristics which we ascribe ordinarily to altruistic processes, that is, love in its most general sense (CP 6.300). Certainly, the idea of group selection may serve as the underlying biological basis for such processes.

Lamarckian evolution proposed growth through inheritance of acquired characteristics. Upon reflection, this model could be applied analogously to cultural transmission. We only need look at advances in technology to see how better practices or solutions to technological problems are transmitted to the next generation, which then builds on these advances to further more advances, and so forth, in a very Lamarckian fashion. The process is altruistic in the sense that, in passing on these improvements, a previous generation cannot possibly benefit from those further improvements. Peirce thought this altruistic process was core to the scientific impulse (CP 7.87; CP 7.185).

Certainly, one may benefit personally from whatever contributions are made contemporaneously with those contributions; but the full import of those contributions will not. Peirce certainly saw this as the essence of scientific advance and the altruistic nature of scientific inquiry (CP 7.54; CP 7.185; CP 7.87). That is not entirely unlike the parent-child relation, in which sacrifices and efforts are made on the parents' part to improve the lives of their children, without any hope of benefitting from their improved lives, since one shall have passed on. We know that *agape* is indeed modeled on parental love, so there is reasonableness in characterizing it so. In this sense, Peirce hopes to counter Social Darwinism, "the Gospel of Greed", with the "Gospel of Love" (CP 6.294).

Winfried Nöth¹

24 Peirce's Guess at the Sphinx's Riddle: The symbol as the Mind's Eyebeam

The symbol may, with Emerson's sphynx, say to man,
Of thine eye I am eyebeam.
(CP 2.302, 1893).

Charles S. Peirce had a life-long interest in the biography and psychology of “great men”. Drafting a list of men and (very few) women of such quality was an endeavor which he pursued in several phases of his life since the 1860s. A recurrent name on his lists was Ralph Waldo Emerson (1803–1882). Emerson was a friend of the Peirce family. In 1907 Peirce recollected some of his boyhood impressions of Emerson's visits to the Peirce house in Cambridge, MA (MS 296; Robin 1969). In his “Materials for an Impressionist List of 300 Great Men” of 1883, Emerson is “provisionally admitted” (W5: 27), but in his list “Men of Feeling, Action, Thought” of the same year, Emerson is included as a “Writer” (not “poet”) within the class of “Men of Feeling” (W5: 35). His list “The Great Men of History” of 1892 includes Emerson as a “philosopher” (W8: 261). Although he had allocated this place of honor to his parents' friend, Peirce was never an admirer of the ideas of Emerson's “transcendentalism”. In 1892, Peirce even distanced himself explicitly from Emerson's philosophical ideas:

I may mention, for the benefit of those who are curious in studying mental biographies, that I was born and reared in the neighborhood of Concord – I mean in Cambridge – at the time when Emerson, Hedge, and their friends were disseminating the ideas that they had caught from Schelling, and Schelling from Plotinus, from Jakob Boehme, or from God knows what minds stricken with the monstrous mysticism of the East. But the atmosphere of Cambridge held many an antiseptic against Concord transcendentalism; and I am not conscious of having contracted any of that virus. Nevertheless, it is probable that some cultured bacilli, some benignant form of the disease was implanted in my soul, unawares, and that now, after long incubation, it comes to the surface, modified by mathematical conceptions and by training in physical investigations. (CP 6.102).

Although Peirce did not include Emerson among the “great poets”, it was in fact one of Emerson's poems, *The Sphinx*, of 1841, which reverberated more permanently in his writings. Already in his early essay *Nature*, Emerson had drawn the poetic picture of the Sphinx asking deep riddles to philosophers. He wrote:

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“... from the era of the Egyptians and the Brahmins, to that of Pythagoras, of Plato, of Bacon, of Leibnitz, of Swedenborg. There sits the Sphinx at the roadside, and from age to age, as each prophet comes by, he tries his fortune at reading her riddle” (1836: 43).

The inspiration which Peirce took from Emerson was mainly from the 14th and 15th stanzas of “The Sphinx”, in which a traveler and poet-philosopher, challenged with the task of answering the Sphinx’s riddle, addresses the “universal dame” in the following dialogue (of which Peirce quotes only lines 4 to 11 in CP 1.310):

“Dull Sphinx, Jove keep thy five wits!
Thy sight is growing blear;
Rue, myrrh, and cummin for the Sphinx –
Her muddy eyes to clear!” –
The old Sphinx bit her thick lip, –
Said, “Who taught thee me to name?
I am thy spirit, yoke-fellow,
Of thine eye I am eyebeam.
“Thou art the unanswered question;
Couldst see they proper eye,
Always it asketh, asketh;
And each answer is a lie.
So take thy quest through nature,
It through thousand natures ply;
Ask on, thou clothed eternity;
Time is the false reply”.

The poem ends, in its 17th stanza, with the lines: “Through a thousand voices / Spoke the universal dame: / ‘Who telleth one of my meanings, / Is master of all I am.’”

The references which Peirce made to this poem are sometimes rather general and sometimes more specific, but it is never Peirce’s intention to offer an Emersonian interpretation of the lines, on which he had his own ideas, “whatever Emerson may have meant” (CP 1.310). In a side remark, he even suggests that the “truths” which he was able to take from the poem may not have been expressed with sufficient clarity by Emerson, for he concludes with respect to one of them that “possibly this curious truth was what Emerson was trying to grasp – but if so, pretty unsuccessfully” (ibid.).

Peirce’s most general but also most explicit reference to Emerson’s poem is in the title of his fragmentary manuscript “A Guess at the Riddle” of 1887/88 (CP 1.354–416 and W6). The paper, which gives an outline of Peirce’s cosmogony, develops the metaphysical thesis that “three elements are active in the world: first, chance; second, law; and third, habit-taking” (CP 1.409) and ends with the conclusion: “Such is our guess of the secret of the sphynx” (CP 1.410).

Peirce's favorite line from Emerson's poem must have been the last verse of stanza 14 since he quotes it repeatedly. Here, the Sphinx addresses the poet-philosopher with the enigmatic words: "Of thine eye I am eyebeam". Peirce was most probably aware of the long tradition in which English language poets since Shakespeare had associated eyebeams with love and fate. He may also have known another verse in which the essayist Emerson uses the metaphor of eyebeams as standing for the words of a book. This line, in which Emerson exclaims, "Read the language of these wandering eye-beams", has meanwhile been eternalized in the *Oxford English Dictionary*, s.v. "eye-beam".

The enigmatic Sphinx is evidently the prototype of a symbol as such. What does she mean when she tells her visitor that the symbol he tries to decipher is his own eyebeam? The traveler's eye is evidently a metaphor of a cognizing mind, and his eyebeam, literally his 'glance', can only be an extension of his mind. If the symbol, the Sphinx, is in fact an extension of the cognizing mind, it cannot be an external "object" with which a Cartesian "subject" is confronted. What the philosophical Sphinx teaches through Peirce is that cognition cannot be accounted for in terms of a dualism between a subject and an object. Instead, when the human mind interprets an external symbol, it somehow interprets itself. The symbol's meaning follows from, is in an irradiation of, the interpreter's mind. It cannot be found outside this mind. Just as the eyebeam irradiates from the eye, the symbol is an extension of the interpreter's mind.

According to Houser, Peirce quoted Emerson's verse concerning the symbol as the eyebeam of its beholder so frequently because it was in line with the philosopher's views on "the elusive connection between thinking and what is thought, between seeing and what is seen" (Houser 1993: xiii). In this interpretation, Peirce puts the anti-Cartesian lesson into the Sphinx's mouth that cognition does not result from the agency of a subject (the poet) faced with an object (the Sphinx). The alleged object of perception, the Sphinx, is not "out there", in a real world of things, but it belongs to the sphere of the perceiving mind. As Guido Ipsen puts it, "The famous sphinx, mocking her human counterpart, refers to her mystery as the very product of the human mind – the riddle is in the mind of the beholder. So too are the symbols: they are the product of the mind" (2010: 172).

To say that the object of perception is in the beholder's mind is to attribute a constructivist position to Peirce, but Peirce's theories of perception (Santaella 2012) and cognition, both branches of his general theory of semiosis, were neither Cartesian nor constructivist (cf. Nöth 2011). What we perceive is "not inside our skulls . . . , but out in the open" objects Peirce (EPII: 62) to the constructivists, but this does not make him a naïve realist either, who believes in having knowledge of the "real things out there", for Peirce goes on to clarify: "What passes

within [our skulls] we only know as it is mirrored in external objects” (ibid.). The external objects which mirror what is going on inside our brains are the signs produced by these brains. Only from external signs, signs of thoughts, desires and feelings, can we know anything about the mind’s inner secrets.

But how can the symbols, if they are extensions of their users’ minds, begin to speak back to those who extend their minds, as the Sphinx does when she addresses the traveler? As early as 1868, Peirce suggested an answer, supported by means of another metaphorical scenario not dissimilar to the one presented in Emerson’s poem. Here, the symbol also begins to speak, but not in the anthropomorphic role of a mythological addresser. It is now speaking back to the creator who once coined her and thus addresses her message to an addressee which is her own father, the symbol maker. The message to her original creator is that she, the symbol, is no longer obliged to obey the symbol-maker’s orders because ever since she was created by him, she has begun to lead a life of her own:

Man makes the word, and the word means nothing which the man has not made it mean, and that only to some man. But since man can think only by means of words or other external symbols, these might turn round and say: “You mean nothing which we have not taught you, and then only so far as you address some word as the interpretant of your thought”. In fact, therefore, men and words reciprocally educate each other. (W2: 241).

This message is not essentially different from the one which the Sphinx addresses to the poet-philosopher, but there is a difference in the perspective from which the scene is observed. What the speaking symbol of 1868 seems to say to her creator is: I am neither the mere external object of your perception nor the mere product of your mind, – not only your instrument, but also your teacher. I can teach you the new ideas which I have learned from other symbols in the course of my life.

The topic of how symbols change their meaning independently from the ideas of their original creators, which Peirce elucidates in 1868 by means of an personified but otherwise unspecified symbol, is taken up again in more detail in 1894. Now, Peirce puts his ideas on how symbols grow into the mouth of Emerson’s Sphinx in order to elucidate how new words are created from old ones and how they grow in meaning:

If a man makes a new symbol, it is by thoughts involving concepts. So it is only out of symbols that a new symbol can grow. *Omne symbolum de symbolo*. A symbol, once in being, spreads among the peoples. In use and in experience, its meaning grows. Such words as force, law, wealth, marriage, bear for us very different meanings from those they bore to our barbarous ancestors. The symbol may, with Emerson’s sphynx, say to man, Of thine eye I am eyebeam. (CP 2.302).

Why should symbols come from symbols and not from symbol-makers, and why should the Sphinx's words elucidate how symbols grow? The line of argument is complex. When a new symbol is introduced, its meaning is by definition unknown because were it known, it would not be a new symbol. Genuine symbols can only come from (other) symbols because they have general meanings, but general meanings cannot be taught directly by means of icons or indices when new symbols first emerge. Showing or pointing whatever they represent cannot convey their general meaning. Only by means of other symbols, whose meaning must be known, can the general meaning of a new symbol be taught. Second, once created, the symbol "spreads among the people" and thereby grows in its meaning in the same way in which the quote from 1868 describes it. Both the speaking symbol of 1868 and the Sphinx of 1894 teach the lesson that there is continuity between the symbol and the symbol user's mind, but the lesson of 1894 teaches more. The eyebeam that irradiates from the eye now also stands for the newly created symbol that receives its meaning from the older one. The Sphinx teaches that symbols are not only extensions of human minds but also extensions of other symbols, which have a life of their own.

Furthermore, the two sources from which symbols grow, on the one hand from the mind of their creators, on the other from the old symbols which convey their new meanings, are not as different from each other as it seems, for the symbol maker is a symbol herself, if we take Peirce's theory of the "true analogy between a man and a word" (CP 7.591) into consideration. Nicola Erny reveals this double sense behind the Sphinx's words as follows:

Symbols grow; their real meaning remains to be revealed in the future. This is the enigma of a symbol, which Peirce puts into the mouth of Emerson's Sphinx.... However, the relation is also reversible: the human being is a symbol since his or her life constitutes a permanent process of inference and only the future can reveal the meaning of this inferential process in its totality. This is so because, first, meaning is itself of a general nature, and second, the purpose of this process consists in a certain way in creating this meaning, which hence, while the process lasts, cannot yet exist as its result. (Erny 2005: 170).

In Peirce's Lowell Institute Lecture on "Consciousness and Language" of 1867, there is further support for the view that the eyebeam also stands for the symbol-maker and not only for the symbol. Here, Peirce comments on the nature of humankind in contrast to animals. Humans "reach out" much further into their environment than animals do. The metaphorical eyebeams irradiating from an eye stand for the human spirit of inquiry into nature. Whereas both humans and animals are organisms (as the eye is, very broadly), only humans strive further, just like the eyebeam which reaches further than the eye, but this reaching out is also a characteristic of symbols. Humans and symbols are eyebeams

and eyes, whereas animals are only eyes without any broader, perhaps even cosmic irradiation:

Each man has an identity which far transcends the mere animal . . . He cannot know his own essential significance; of his eye it is eyebeam. But that he truly has this outreaching identity – such as a word has – is the true and exact expression of the fact of sympathy, fellow feeling – together with all unselfish interests – and all that makes us feel that he has an absolute worth. (CP 7.591).

Erny even attributes ethical connotations to this usage of the eyebeam metaphor when she writes: “Here, the capacity of the human being to extend its identity to a human counterpart is not only put in a structural analogy with the function of a symbol; it is also evaluated. The *outreaching identity* [. . .] can confer continuity to the identity of the human being and allows both the development of a self and a distancing from one’s self [. . .] in an unselfish relation with the other” (2005: 191).

Emerson’s lines serve to support still another dogma of Peirce’s philosophy, his claim that genuine introspection is impossible. We cannot look into our own minds. Neither immediate self-consciousness nor direct knowledge of our feelings is possible. Peirce reads this theory into the above quoted stanzas of “The Sphinx”, conjecturing that Emerson might have meant the following: “Although the entire consciousness at any one instant is nothing but a feeling, yet psychology can teach us nothing of the nature of feeling, nor can we gain knowledge of any feeling by introspection, the feeling being completely veiled from introspection, for the very reason that it is our immediate consciousness” (CP 1.310). The same metaphor now suggests that we can only see the eyebeam irradiating from the eye but cannot look into its inside. While the eye stands for the mind whose contents remains hidden, the eyebeam stands for the signs by which the mind extends into its environment and from which we can read some of the mind’s contents.

The philosophical question why genuine introspection is impossible cannot be examined any further here. We can only restrict ourselves to the metaphor of the eyebeam. Peirce himself gives this clue to its meaning elsewhere in the same year:

Whatever we say of ideas as they are in consciousness is said of something unknowable in its immediacy. The only thought that is really present to us is a thought we can neither think about nor talk about. “Of thine eye I am eyebeam”, says the Sphinx. We have no reason to deny the dicta of introspection. (CP 7.425).

We have seen that Peirce makes use of Emerson’s eyebeam metaphor for a variety of purposes. It serves to elucidate his theories of perception, cognition,

self-consciousness, the impossibility of introspection, and of the creation and the growth of symbols. Is there a common denominator which may explain why he used this metaphor so often? The most general lesson which Peirce seems to take is the one against dualisms of all kind. Dualism, he says, is “the philosophy which performs its analyses with an axe” (CP 7.570). As an alternative, he offers “synechism, the doctrine that all that exists is continuous” (CP 1.172). The eye-beam, which connects the mind in a continuous line with the objects cognized, can be read as a metaphor of the continuity not only between seeing and what is seen but also between the brain and the ideas “in it”. Let us conclude with what Peirce says about the continuity between these two: “Logicians imagine that an idea has to be connected with a brain, or has to inhere in a ‘soul’. This is preposterous: the idea does not belong to the soul; it is the soul that belongs to the idea. The soul does for the idea just what the cellulose does for the beauty of the rose; that is to say, it affords it opportunity” (CP 1.216). At this point, Peirce also goes beyond the idea of continuity between cognition and what is cognized and addresses also the issue of the autonomy of the sign in relation of its users, but this topic, only briefly addressed above, requires further elaboration (see Nöth 2009).

Michael L. Raposa¹

25 Love as Attention in Peirce's Thought

It is not by dealing out cold justice to the circle of my ideas that I can make them grow, but by cherishing and tending them as I would the flowers in my garden. The philosophy we draw from John's gospel is that this is the way mind develops; and as for the cosmos, only so far as it yet is mind, and so has life, is it capable of further evolution. Love, recognizing germs of loveliness in the hateful, gradually warms it into life, and makes it lovely.
(CP 6.289, 1893).

Published in 1893, as the last in a series of five articles appearing in *The Monist*, "Evolutionary Love" completes the account of Peirce's mature cosmology developed in those writings. The religious and metaphysical significance, both of this particular article and of its companions, has received extensive commentary in the secondary literature devoted to Peirce's thought (Murphey 1961: 321–54; Raposa 1989: 63–92). For present purposes, however, the most useful context for interpreting the passage under consideration is supplied by Peirce's philosophy of mind, his understanding (articulated very early on and then affirmed throughout his philosophical career) of cognition-as-semiosis. Two observations, both to be developed here, seem salient at the outset. The "tending" of ideas (as of flowers) is one particular practice of *paying attention*. Moreover, love's recognition of "loveliness in the hateful", most essentially, is to be understood as an act of *sign interpretation*.

Peirce himself provided the interpretive context for this passage by immediately referring the reader back to "The Law of Mind", the third article published in his *Monist* series. In addition, the cosmological speculations embedded there themselves gesture even further back to several of Peirce's early articles that appeared in the *Journal of Speculative Philosophy*, as well as forward to his later work in semiotic theory. On the general account supplied by that theory, semiosis is both triadic and processual. Every *sign* represents some *object* to which its *interpretant* also stands in a mediated sign-relation. Since the interpretant is a sign, it invites further interpretation. Meaning itself, then, is not so much the characteristic of some particular sign but is always in "a state of incipency or growth" (CP 1.615; here he was making a claim about the "essence of Reason", but for Peirce all thinking was in signs and the development of Reason consisted in its gradual embodiment in signs).

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The connecting of one sign with another in the stream of thought, Peirce observed very early on, is something that is achieved largely through the power of attention. In whatever form that it is exercised, attention does “produce a very great effect upon subsequent thought” (CP 5.295; W2: 231–32). In the first place, attention plays a key role in habit formation and thus in all inductive reasoning (CP 5.296–97; W2: 232–33). One’s attention is “excited” by the perception that a number of different things all share the same character in common. As a result, these things become linked by a general idea describing them as being similar in that relevant respect. This is the generalizing tendency that Peirce discussed at some length in his explication of the law of mind (CP 6.104; W8: 136). Yet, the role that attention plays in shaping semiosis is not limited to induction. Deductive reasoning involves bringing attention to bear on a specific aspect of some premise (while ignoring other aspects) for the purpose of explication; consequently, deduction “may be considered as the logical formula for paying attention” (CP 2.643; W3: 337). Moreover, any kind of abstraction will involve an act of attention; and the link between Peirce’s reflections on abstraction (shaped especially by his study of Duns Scotus and medieval thought) and his ongoing development of the logic of abduction has been well-documented (Boler 1963: 79–88). Generally speaking, hypothetical reasoning must always be rooted in careful observation, a practiced attentiveness to phenomena as they appear.

Peirce’s mature theory of inquiry backed away from the portrayal of thought as being rigidly embodied in distinctive syllogistic forms, that is, from the sort of characterization that was more prominent in earlier writings. Later in his career, Peirce regarded the various modes of inference as being complementary and thoroughly intertwined in human reasoning. The formation of new hypotheses can occur only against the illuminating backdrop created by a vast array of inductively established habits of thought (many of which are shaded in the darker parts of consciousness). In addition, the initial consideration of any hypothesis will always already involve some deductive explication of the various consequences that would be entailed if the hypothesis were shown to be true. Just such an account of how the various “stages” of inquiry are co-involved in any process of reasoning is embedded in Peirce’s 1908 essay on “A Neglected Argument for the Reality of God” (CP 6.452–91).

The “tending” to ideas that Peirce described for the reader of “Evolutionary Love” is also portrayed there as a “cherishing”, that is, as a form of attentive love. The link between love and attention is established in a fairly straightforward way by the commonsensical observation that one cannot really claim to love that to which one does not attend. Yet this minimalist observation fails to capture the extent to which a certain kind and quality of attention, for Peirce,

constituted the very essence of love as agape. It must be a disinterested, self-sacrificing form of attention, not a harsh judging of ideas based on some pre-conceived standard, but an open attentiveness comparable to what Peirce prescribed for someone wishing to engage in musement (CP 6.459). One does not make flowers grow according to some rigid plan; one watches them grow, while also facilitating their growth by caring for them (but, of course, to *care* about X is always also to attend to X in a certain fashion).

There is a self-sacrificial element built into the very concept of semiosis that Peirce so carefully formulated. No interpretant fully “captures” the meaning of its object. Rather, an interpretant is the servant of meaning, facilitates its growth, by mediating but also deferring meaning to another interpretant-sign. Now on Peirce’s view (again, one articulated already in his earliest writings) every person is a symbol, analogous to a word, so that a “man denotes whatever is the object of his attention at the moment” (CP 7.591; W1.498). That man’s “interpretant” may be embodied in subsequent cognitions, that is to say, in his “future self;” but his interpretant could also be “another person who he addresses”. Indeed, the existence of a person is not “cut off from the external world, for feeling and attention are essential elements of the symbol itself” (CP 7.593; see also W1: 498–99). Within Peirce’s synechistic world view, all persons or selves are a bit fuzzy at the boundaries. On his account, for example, human communities that display considerable *esprit de corps* can legitimately be regarded as “greater persons” (CP 6.271; W8: 182). In the more limited case of two persons who are in sympathetic communion with each other, one person can effectively serve as the other’s interpretant.

How might the “recognition” of some aspect of a thing produce the sort of transformative effect (“makes it lovely”) that Peirce suggests? By attending carefully to selected features of some object, a person can function as a sign to mediate those qualities, either to some future version of herself or to someone else. Now the recognition of any X as Y always takes the form of a hypothetical inference. It can occur instantaneously, but it typically represents an interpretive achievement, as the repeated attention to or observation of certain selected qualities establishes a salient habit of mind that enables the recognition of something as possessing those qualities. (This kind of habit constitutes a type of perceptual skill, developed gradually through practice). Such interpretation can be self-transformative, as it affects the way one’s future self might perceive some object hitherto regarded otherwise. Additionally, it could be transformative for others to the extent that one acts as a sign mediating some fresh perspective on the object to other interpreters. Finally, if the object of attention is another person, a self to whom one addresses oneself as a sign, then such a recognition could also be transformative for that very person. In all of these instances, the

“making lovely” that Peirce described must be understood, in semiotic terms, as a real growth of meaning. One’s loving attention can result in the creation of new meaning, not only for oneself, but also for those others whose experience of the object is mediated by oneself as a sign (including cases where the other itself constitutes the object of attention).

A variety of phenomena can be illuminated by Peirce’s remarks appearing at the beginning of “Evolutionary Love”, especially when their semiotic context and implications are fully understood. Josiah Royce began to explore some of these implications in his later work, especially in his discussion of love, loyalty and communities of interpretation in *The Problem of Christianity* (Royce 2001). His work is an important complement to Peirce’s for the purpose of the ongoing development of these ideas (as well as providing a living illustration of how one person’s sympathetic attention to another’s thought can result in the real growth of meaning). Other possible implications deserve careful consideration. The crucial importance of the role of therapists or counselors in facilitating for other persons the kind of self-awareness that they might not otherwise be able to achieve alone is the sort of phenomenon that might usefully be analyzed in explicitly semiotic terms. Similarly, various spiritual practices may be conceived as complex forms of semiosis, for example, the sort of Buddhist mindfulness exercises that can result in dramatically transformed perceptions over time; as the result of such exercises, a person formerly despised or regarded as an enemy can gradually come to be recognized as someone beloved (Nhat Hanh, 1997). In what way is this a semiotic phenomenon? Consider how Peirce observed that “the fixation of attention” is what causes the “subjective intensity” of certain ideas to increase. Moreover, the deliberate, self-controlled exercise of attention is what he understood as consisting in “contemplation”. Through contemplation, one gradually comes to recognize “what may lie hidden in the icon”, previously shaded or obscured (CP 7.555).

The “germs of loveliness” that remain invisible in ordinary cases of perception will become accessible to one who attends patiently and properly. Once again, this is a cherishing, loving form of attention, not issuing in harsh or rigid judgements, but one that is fully “open, awake to what is about or within you” (CP 6.461). A certain disinterestedness combined with a spirit of self-sacrifice are the qualities that enable such attention. They also enable the interpreting self to act most effectively as a sign and servant of meaning.

Rossella Fabbrichesi¹

26 A Person is Like a Cluster of Stars

Personality, on both sides, that of the unification of all of a body's experiences, and that of the isolation of different persons, is much exaggerated in our natural ways of thinking, ways that tend to puff up the *person*, and make him think himself far more real than he veritably is. A *person* is, in truth, like a cluster of stars, which appears to be *one* star when viewed with the naked eye, but which scanned with the telescope of scientific psychology is found on the one hand, to be multiple within itself, and on the other hand to have no absolute demarcation from a neighboring condensation".² (R 403, 1894).

Peirce wrote this manuscript at an unspecified date in 1894 and I owe this piece of information to André De Tienne who quotes it in a 2002 article. In my opinion, this manuscript contains the most elaborate and complete synthesis of Peirce's ideas about the person, the Self and his social circle. So it seems to me emblematic of the various stances the author took on these themes during the years, and I would like to make some comments, as it is an excellent introduction to his thought about those matters.

As it is well known, already in his writings of 1868 (cf W2: Ch. 21–23) Peirce denied the substance of interior experience, the introspective capacity, and above all the steady essence of a personal identity, not immediately turning into a semiotic flow, which could lead to self-consciousness and the awareness of one's own actions. Denying the reality of personality "it is not anti-spiritualist, it is anti-nominalist", he will write later on, and "to say I is an exaggeration" (CP 8. 83).

Man is a sign, says the final part of *Some Consequences of Four Incapacities*; his is a glassy essence. As a sign, he totally becomes manifest in the symbols he uses, in the habits of responses he adopts, in the effects he produces and in the actions he does. We are accustomed to identifying the Self with the will, the conscience, the capacity for deciding and making solutions but "the identity of man consists in the consistency of what he does and thinks" (W2: 241) and this consistency expresses itself through signs and is translated into habits and practices, which are never actually personal or individual.

"The observation of facts has now taught me that that the Ego is a mere wave in the soul, a superficial and small feature, that the soul may contain several personalities" (CP 1.112), writes the author. In this sense we can, I think, associate Peirce's thought with that of a great author of the twentieth century, Simone Weil.

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² The manuscript is marked as R 403 and is quoted by A. De Tienne. "The Sign in Person". *Cognitio* (2/2002).

Weil writes: “What is sacred, well far from being the person, is what is impersonal in a human being. Anyone who penetrates the sphere of the impersonal finds a responsibility towards every human being – that to protect in him not the person but every fragile possibility a person holds to proceed to the impersonal”.³ In the beginning, then, it is the relation, the being in common, not yet separated and identified with the various personal subjects. “The individual man”, concludes Peirce in *Some Consequences* – “since his separate existence is manifested only by ignorance and error, so far as he is anything apart from his fellows, and from what he and they are to be, is only a negation. This man, proud man, most ignorant of what he’s most assured, his glassy essence” (Shakespeare, *Measure for Measure*, II, 2) (EPI: 55).

By the way, we can add that Peirce was very much concerned with personality meant as multiplicity (as well with multiple personality and telepathic experiments). Or, rather, he worked on a theory where individuality as dispersion into community was exalted. The thought Peirce gives us in the manuscript is indeed bivalent: first of all there is no individual who is fully ‘un-divided’, i.e., not split in his inner self – a thought that has crossed philosophy since the days of Goethe, who explicitly wrote that any individual is a plurality, and even when it appears as a singularity, it remains a reunion of living autonomous beings. Nietzsche, in turn, worked over and over on his Goethian perspective, eventually developing his idea of a collective nature of the self. The in-dividuum is not at all a ‘non-dividuum’ entity, but it is something internally spread and externally open to interpretations and modifications.

But Peirce adds that even the entire community could be regarded as a large individual and the single persons as its limbs, acting together in the flow of action, with no real separation between one member and the other.

There are passages of the writing *The Doctrine of Chances* (W3: ch. 62) where this link is highlighted as something framing the same possibility for the individual to behave ethically and rationally. The soldier who strives hard in the fight to conquer the hilltop makes a reasonable choice, Peirce writes, since he identifies himself with all his regiment, even if this reasonableness may – in one but fatal case – lead him to the most unreasonable occurrence of all – that is to death.

Thus, every single interpreter relies upon the endless and possible interpretations made by the community he belongs to, incorporating with them, identifying his own interests with those of a boundless community – an identification that springs from ethic principles, more than from a rigid calculus of probability.

The supreme interest that leads us does not grant us certainties but hopes: hope that the community may be able to last and guarantee my inferences

3 S. Weil, *E'crits de Londres et dernières lettres*, Gallimard, Paris, 1957.

beyond any possible limit, that may always witness the overall truth of my choices, that what we call ‘reality’ may turn out to be true in the final opinion.

When I express my feelings to a friend during a strained conversation, when I reason like a soldier during the battle, I go out of the enclosure of the Self (if ever one can believe that such enclosure really exists) and my soul dissolves in the community. *Koinà ta philon* said the Greeks: let things be in common for friends. It is not a matter of a sort of co-feeling, but of building a greater body, a complex community, a vast mind. “There is a miserable material and barbarian notion according to which a man cannot be in two places at once; as though he were a *thing!*” (W1: 498). Like every sign, a man is just where he *is acting* as a sign, where he *generates other signs*. “Two minds can communicate only becoming the same mind”, that is expressing the same Logical Interpretant – we read in manuscript number 498 – and in a letter to Lady Welby Peirce coins the term *Commens* to point out that “mind into which the mind of utterer and interpreter have to be fused in order that any communication should take place” (EPII: 478).

Let us now move to the second part of the manuscript. We have said that every person is a sign, actually an incessant flow of semiosis, and we have added that each individual is a community – when we search for ourselves we hear a large polyphony of voices, the manifold murmuring of the many selves that inhabit the space our conscience has dug.

During the ‘90s, however, Peirce comes to another conviction that somehow reverses and specularly completes the one just expounded: not only is each individual a community, but each true community behaves like an individual. Also, the general signs, the complex ideas that have universal value, behave as if they were persons. In *Man’s Glassy Essence*⁴, written for the ‘Monist Metaphysical Series’ in 1892, Peirce goes back to the themes of his essay of 1868, and explains them as a too-rigid nominalistic version of his thought, asserting that there is a deep unity and consistency (that is, as he said in 1868, a proper personality) in some general ideas. For example the idea of truth and justice, capable of pushing large masses of men to move, fight and sacrifice their own lives for an ideal. Besides, he wonders, what is personality if not “a bundle of habits” (EPI: 331)? Habits and practices identify individuals, not the other way round. And habits are always collective, never strictly personal or idiosyncratic.

So, a person is nothing more than a certain type of general idea, a symbol or a web of symbols – and vice versa a general symbol has the living and unified *feeling* of a person, “it is my creature” (EPII: 354), Peirce writes. An idea I cherish is therefore felt as something I have created: I love it and will devote myself to perfect it and grow it like a flower.

4 EPII: 334–351.

In like manner there must be something like a personal conscience crossing the bodies of those who share a deep and sympathetic communion of intents. Peirce refers to the *esprit de corps*, to the national sentiment, to sympathy; and these concepts should not be only considered as metaphors.

“Ideas tend to spread continuously – *celebrates the synechistic motto* – and to affect certain others which stand to them in a peculiar relation of affectability. In this spreading they lose intensity but gain generality and become welded with other ideas” (EPI: 313).

Thus, they become living realities, developing teleologies. Hence, we are in front of kinds of ‘corporate personalities’ or ‘corporations’ (W1: 351, terms that will be resumed by Royce), ‘greater persons’ or superior bodies.

Finally, Peirce appeals to the fact that a multitude of people, when cherishing the same ideals and acting for a common interest, can work as one person, a powerful single organism that operates as a unitary ensemble. “When the thirty thousand young people of the Society for Christian Endeavour were in New York” he writes, “there seemed to me to be some mysterious diffusion of sweetness and light” (EPI: 350).

Today, the social reality undeniably testifies this change of the body towards the foundation of great ‘corporations’ built on a common listening, watching and doing – that, while seemingly exalting the individual and his uniqueness, completely eliminate him as a critical and independent subject. Let us consider the widespread thinking extension (in the true sense of a *res cogitans* which becomes *extensa*) that dominates human participation to the new media and the areas of cultural interchange. Let us consider what today is mainly identified with the noble and revolutionary word ‘common’: the web of the social networks, with its inextricable ganglia; the civilization of communication or, if you like, of the homologation of ‘the One’ (Heidegger’s *Das Man*), where *one* says and *one* does what is a habit of doing and saying. It is a culture we are all *subjected to*, someone more and someone less – which means that we are about to become new *subjects* in reference to it. And new philosophical subjects too, of course – in the ancient meaning of *philo-sophoi*, that is, of *friends* of this *common* knowledge.

Peirce regarded such absolutely new individualities he saw taking shape as immense star clusters, joining and scattering according to the orbit and the needs of the path. Seen with a telescope, these communities crawl like a group of leafcutter ants; seen with the naked eye they appear to be a plural but coherent unity, moving forward as a single body – a formation that *means* unity, but is not exactly oneness in a strict sense. In such a way, the new ‘connected’ human community that is organizing under our eyes today embodies a phenomenon that can be properly called super-human or super-organic, that is, as Nietzsche wanted, over-human.

Mathias Girel¹

27 Crystal-Clearness: For the Second-Rates

Crystal clearness, such as we justly require in mathematics, in law, in economics, is in philosophy the characteristic of the second-rates. The reason is that the strongest men are able to seize an all-important conception long before the progress of analysis has rendered it possible to free it from obscurities and difficulties. (CN2 84, 1894).

This gem is buried, as many others, in one of the numerous contributions by Peirce to *The Nation*; it is part of a review of Spinoza's *Ethics* written in 1894, when Peirce already had the benefit of hindsight concerning his early papers, when he had been in the process of revising the *Illustrations* for his *Principles of Philosophy* or for *Search for a Method*. The statement might seem paradoxical enough: isn't Peirce the author of *How to Make our Ideas Clear* (hereafter: HMIC), the seminal paper for the pragmatist tradition, a paper that is sure to be included in each and every anthology of American thought? How can clearness then be "the characteristic of the second-rates"? I take it that these perplexities arise only in a superficial reading of HMIC and that the present quote tells quite a lot about Peirce's doctrine and style. I submit here at least two beginnings of an answer. The latter would itself deserve a fuller development² but I will confine myself here to what this quote says about Peirce's philosophical style and about the way one can respond to his texts.² The first section concerns the method one should adopt in philosophy and explains in part why belief and doubt play such an important role in the *Illustrations* series. The second one concerns the kind of problems Peirce felt attracted to and how we can make sense of what he says about the "strongest" thinkers.

The Philosophic Difference

First, let's acknowledge that Peirce's claim certainly has a paradoxical sound to it. In HMIC, Peirce insists that we can obscure discussions by using words that are totally devoid of any meaning, by being led astray by mere homonymies and non-obvious synonymies. Peirce's idea, notoriously, is that the "logicians", in the wake of Descartes and Leibniz, have often contented themselves with the two first grades of clearness: clearness as (perfect) familiarity with a notion and

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² Any discussion on the topic of clearness in Peirce should now start with Colapietro 2009.

clearness as distinction – as in a good definition – when nothing remains that we do not understand. Peirce thinks that these two “grades” are not enough to dissolve the kind of obscurity in which metaphysicians keep the present state of the debate. He offers thus a third grade of clearness, the pragmatist one: one may make a notion clearer by paying attention to its use, to its role in theories: “Consider what effects, which might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object”. (W3: 266) In which kind of practices, in which uses, is this conception actually involved? Answering these questions is often indispensable to develop fully the meaning of a conception. Peirce, by offering his “pragmatist” maxim and by highlighting the practical bearings of the object of our conception, wants to uproot the cardinal error of lazy thinkers, mistaking “the sensation produced by our own unclearness of thought for a character of the object we are thinking” (W3: 264). Making this subjective obscurity explicit and dismissing it is one of the first and main services of pragmatism, in view of putting a term to unending philosophical disputes, and also of opposing practical and political ways of taking advantage of obscurity³. But isn’t that kind of conceptual elucidation equivalent to “crystal-clearness”?

Firstly, a higher grade of clearness is not equivalent to perfect and total clearness. After all, what is needed is not a pragmatist equivalent of Cartesian intuitions or sensationalist impressions, as if we were to trade a kind of immediacy for another, but tools preventing us from falling in the grip of systematic fallacies. When James offered his 1898 gloss to *How to Make our ideas clear* in *Philosophical Conceptions and Practical Results*, he also provided some details about his own understanding of the pragmatist maxim: “To attain perfect clearness in our thoughts of an object, then, we need only consider what effects of a conceivably practical kind the object may involve: what sensations we are to expect from it, and what reactions we must prepare” (James 1978: 124). This sentence involved – perhaps – a different account of practice, understood in terms of particulars, whether of “acts” or of “sensations”; but it also introduced a change in the description of the *effects* of the pragmatist maxim. James claimed that we could reach *perfect clearness* where Peirce used the comparative register rather than the superlative one: he provided a method for attaining to

3 “Instead of perceiving that the obscurity is purely subjective, we fancy that we contemplate a quality of the object which is essentially mysterious; and if our conception be afterward presented to us in a clear form we do not recognize it as the same, owing to the absence of the feeling of unintelligibility. So long as this deception lasts, it obviously puts an impassable barrier in the way of perspicuous thinking; so that it equally interests the opponents of rational thought to perpetuate it, and its adherents to guard against it”. (W3: 261).

“a more perfect clearness of thought” or “a method of reaching a clearness of thought of a far higher grade than the ‘distinctness’ of the logicians” (W3: 261). Our quote is thus paradoxical only in James’s reading. There might be other grades of clearness (Kent 1987: 236), and grasping clearly a key notion does not mean that all the notions involved in the theory are themselves crystal-clear, even though they would certainly have to be so for a nominalist, prone to think of everything in terms of particulars.

Secondly, Peirce’s point is not about such and such notion, but about *philosophy*. Well before 1894, Peirce thought that total clearness might be attained in economy and in law but was not reachable everywhere and certainly not in philosophy, for the time being, which does mean that he would have the slightest indulgence towards those who do not try to be as exact and clear as possible in that domain. In 1868–69, Peirce had drawn a difference between sciences where treatises could be made – Dynamics and Astronomy for example (W2: 188) and other disciplines that had not reached (yet) that very stage. Treatises can be made in disciplines where a reasonable consensus about methods and results obtains, and where one does not meet the doubts of other competent inquirers at every corner. In most discussions however, metaphysicians, whether properly trained or not, do not agree⁴, and for this very reason, their main conclusions remain doubtful: “Whatever is doubted by men whom there is reason to think as competent judges, is so far doubtful; and, therefore, a certain shade of doubt will hang over almost all psychological or very general propositions” (W2: 189). The first sentence is a permanent component of Peirce’s theory of inquiry, the context confirms that the second part is a conclusion pertaining to philosophy, at least to philosophy when it does not stick to the style of the experimental and natural sciences before they are settled. Perfect clearness in that domain would be, for now and for that very reason, *specious, fake*, clearness. There are significant consequences to this, concerning both the method and the premisses adopted in philosophy.

As regards its *premisses*, philosophy, as the other sciences, must rest on “those ordinary facts of which (in a general way) we are actually assured and therefore *cannot*, if we would, mistrust”. (W2: 189) It is for this reason that cognition will be approached not by starting directly with the concept of truth, where we would be instantly lost in a “sea of metaphysics”, but with conceptions that we cannot doubt belong to inquiry, belief and doubt (W2: 357). There

⁴ “It is to no avail that philosophers adopt strictly demonstrative forms of argument as long as they cannot, after all, come to agreement upon certain conclusions. What competent men disagree about is not certain” (W2: 187).

is a straightforward and often overlooked continuity between the 1868 and the 1878 papers: the former ones provide the starting point of the latter. We have to focus and doubt because *in the present state of the debate*⁵, the concept of truth itself is rendered doubtful: “that which we seek in an investigation is called truth, but what distinct conception ought to be attached to this word is so difficult to say, that it seems better to describe the object of an investigation by a character which certainly belongs to it alone, and which has nothing mysterious or vague about it” (W2: 355). This “character” consists in the fact that, when we inquire, we aim at resolving doubts, at switching from doubt to belief (See W3: 35, among many other instances). *So, the fact that the theory of inquiry starts with considerations on belief and doubt is itself the after-effect of a general doubt about truth.* Belief and doubt are deemed clearer and are used as means to approach the important and strategic concept, that of truth.

As regards style and *method*, if philosophy has to mimic something in the sciences, it is not the demonstrative style, not the “rigidness of proof”, but “those less complicated reasonings upon which Galileo established the laws of motion and Copernicus the order of the solar system” (W2: 190), that is to say multilayered arguments, relying on sundry sorts of inductive support, looking like “cable[s]” (W2: 213) more than like “chains”. According to Peirce, the principle of inertia, was “more than a shrewd guess” when he was first enunciated by Galileo, but “was not supported on all sides” (W2: 188). Galileo too was able to seize an “all-important conception” in a clouded debate and long before other men could make use of it. Philosophy, Peirce ventures, might be in the same state now than dynamics just before Galileo, when no clear consensus was extent, but when indifference was not considered anymore as the last word of wisdom. We have to trace philosophical theories to their consequences and then, “see how many facts they serve to explain, and which are the ones which require to be retained” (W2: 188). Finding which conceptions can highlight others, still in the dark, is the flesh and bone of philosophical activity: our quote just drives this point home.

That was a general reason why there is something suspect about crystal-clearness in philosophy and it is an interesting question, not to be treated here, whether this is only a temporary predicament or whether this is a permanent feature.

⁵ See also “Mathematics does not *need* to take up any hypothesis that is not crystal-clear. Unfortunately, philosophy cannot choose its first principles at will, but has to accept them as they are” (CP 4.176).

A Sense of Legitimate Obscurity

Sometimes, too, obscurity is a price to pay to tell and to see something new. Peirce's "Ethics of Terminology" (CP 2.222) claiming that a new scientific conception needs a new word or a family of "cognate words" but that one must be careful not to use a new word if this conception is another former one in disguise certainly led his contemporaries to charge him with a certain amount of philosophical obscurity. "Thirdness", "Cenopythagorean", "Praescisive", not to mention "Papyrobite" (CP 2.763), might cause such an impression, while they are in fact introduced to make it clear that they embody new conceptions, with a distinctive conceptual function, and the temporary bewilderment in front of them will always be better than a spurious and unfounded feeling of familiarity⁶. This is why Peirce turned so angry at James when the latter used the term "pragmatism" to refer to his own philosophy, "transmogrifying" it by the same effect. This terminological creativity can be found in the many lexicographic contributions by Peirce: dozens of entries in Baldwin's *Dictionary*, *thousands* of entries for the *Century Dictionary*, from cocktail names to the most abstract notions of mathematics, which makes this last dictionary seems quite special, since some of the words, we suspect, find in this dictionary their one and only occurrence, which certainly has a Borgesian charm to it.

But this is only the tip of the iceberg. In *The Basis of Pragmatism in the Normative Sciences*, Peirce urges that mastering the normative sciences would be tremendously important in order to understand the "rationale of Pragmatism", and he adds that instead of providing a full survey, "the reader [will] instead have to traverse this space, so full of marvels and beauties, as in a night train, pent up in this cramped section, obscure and airless" (EPII: 376). Traveling in the amazing landscapes of metaphysics as in a night train launched at full speed is certainly something that more than one has felt reading Peirce. There is a kind of vital urgency in that, which has nothing to do with the "vitally important problems" required by James for the 1898 Cambridge Lectures, but everything to do with the fact the fundamental problems are raised, that the most likely ways to attack them are clearly seen, but with little hope that enough time is left to provide a full treatment of all of them. Confining oneself to the most important questions is often a way to leave deliberately all the minor questions in the shadow. There is a strategic choice to make when approaching a new field of inquiry and sometimes obscurity is a price to pay for strategic clearness:

⁶ "It is good economy for philosophy to provide itself with a vocabulary so outlandish that loose thinkers shall not be tempted to borrow its words" (CP 2.223).

“I am, as far as I know, Peirce remarks, a pioneer, or rather a backwoodsman, in the work of clearing and opening up what I call semiotic, that is, the doctrine of the essential nature and fundamental varieties of possible semiosis; and I find the field too vast, the labor too great, for a first-comer. I am, accordingly, obliged to confine myself to the most important questions” (EPII: 413). For these all-important questions, clarification is perforce *local* first. The temporary obscurity, in the remote parts of the “too vast” field then opened, is the direct effect of these radical breakthroughs, in the same way that knowledge, by opening new fields of inquiries, fresh “knowledge-to-be”, creates its own kind of ignorance. James, at the beginning of *Pragmatism*, credits Peirce with the method of pragmatism, but insists at once on Peirce’s “flashes of brilliant light relieved against Cimmerian darkness” (James 1985: 10). To his credit, James does not claim that everything is obscure in Peirce; just after, he seems to understand that in addition to the subjective obscurity that might be dispelled, there might be a kind of “objective” obscurity, of the sort that one feels in front of the immensity of a problem: “There is, it must be confessed, a curious fascination in hearing deep things talked about, even tho neither we nor the disputants understand them. We get the problematic thrill; we feel the presence of the vastness”. There is a name for that feeling in philosophy, even though it might give a pause to strict Kantians: it is an *analogon* of the sentiment of the sublime, a sublime that would occur not only in front of mathematical and dynamical immensity, as Kant has it, or in front of political power, as Burke has it sometimes, but in front of thought, in front of the monuments we have that give a sense of the immensity of what would remain to be thought and of the immensity of the task. Peirce himself has compared architectural monuments, and in particular monuments associated with the sublime, to those of thought. To get an idea of what a scholastic reasoning consists in, he suggests, look at a cathedral: “there is nothing in which the scholastic philosophy and the Gothic architecture resemble one another more than in the gradually increasing sense of immensity which impresses the mind of the student as he learns to appreciate the real dimensions and cost of each” (W2: 466). This is no passing reference and is not a mere historical remark, since, concerning his own philosophical bent, Peirce confessed later in strikingly similar terms: “There is . . . nothing more wholesome for us than to find problems that quite transcend our powers, and I must say, too, that it imparts a delicious sense of being cradled in the waters of the deep, – a feeling I always have at sea” (CP 8.263). This “oceanic feeling”, depicted here well before Romain Rolland and Sigmund Freud used the phrase, is something Peirce voiced several times. For example, when he understood that the fundamental question in philosophy was not “How is a priori synthetic judgment possible?” but “How is synthetic judgment possible?”, which led him to find, under the

apparent simplicity of Kant's table of judgments, the unbound ocean of semiotic relations, he commented upon this discovery in terms that perfectly express the temporary lucid disorientation that is at the core of most important philosophical breakthroughs: "Suffice it to say that I seemed to myself to be blindly groping among a deranged system of conceptions" (CP 5.163). Understanding a philosopher better than he would have understood himself, feeling that something is wrong at the fundamental level, when the means to explain how and why have to be devised for that purpose, is just another way to "seize an all-important conception long before the progress of analysis has rendered it possible to free it from obscurities and difficulties". The "strongest men" are not the ones for which everything is clear, but those who can see clearly *in* the twilight.

Phyllis Chiasson¹

28 On the Nature of Rare Minds & Useless Things

True science is distinctively the study of useless things. For the useful things will get studied without the aid of scientific men. To employ these rare minds on such work is like running a steam engine by burning diamonds. (CP 1.76, 1896).

Although some will dismiss these words as pure hyperbole, others will recognize that, embedded within this brief statement, are several significant concepts. These concepts include, but are not limited to, a) the logic of Retroduction, b) Continuity and Fallibilism, and c) Peirce's phenomenology (Doctrine of Categories).

Background

Peirce first mentioned the relationship of the study of useless things to true science in a brief comment during his 1908 Cambridge Conference Lecture on "The Logic of Continuity" (Peirce 1908: 244²). His thinking was mature by then, suggesting that this statement, though dramatic, was not merely careless verbiage on his part. He conceived a true relationship between science and the study of useless things. This first occasion provides a context of sorts for his meaning of *uselessness* as it relates to scientific study and he located the term within a discussion of the conjoined doctrines of Continuity and Fallibilism. In this first mention of useless things (1908), Peirce wrote:

Remember, that even the stupendous Descartes abandoned the study of geometry. And why? Because he said it was useless. And this he said *a propos* of conic sections! That he should have thought conic sections useless, is comparatively pardonable. But that he the Moses of modern thinkers should have thought that a philosopher ought not to study useless things is it not a stain of dishonor upon the human mind itself? (Ketner 1992: 244³).

¹ Davis-Nelson Company, USA.

² Although the footnote on pg. 19 in CP 1 (§43) identifies this text as having been written in 1896, Andre de Tienne of the Peirce Edition Project recently informed this writer that current textual analysis dates the quotation after the 1898 lecture.

³ Peirce, Charles S. 1992. Reasoning & The Logic of things. (Ed) Kenneth Ketner (ed.). Cambridge, MA: Harvard University Press.

Some might argue that Peirce said ‘philosopher’ here, not ‘scientist.’ However, although the term *scientist* had been split from that of *philosopher* sometime around 1834, in Descartes time, no such distinctions were made. Additionally, Peirce was a philosopher of science, as well as an active scientist. For him, the terms, *philosopher* and *scientist*, must have seemed inseparable; he tellingly stated, “I wish philosophy to be a strict science, passionless and severely fair” (CP 5.537). So, why not use the above quotation from Peirce’s Cambridge Conference Lectures?

In the Cambridge lecture, Peirce made no direct mention of the relationship between *rare minds* and *useless things*. The fact that he made such a connection in this second comment (CP 1.76) is suggestive, because it indicates the possibility of a connection between different ways of thinking and of inquiry. Such a connection could imply that rare minds are rare because they have a particular manner, or pattern, of engaging with ideas and materials. Peirce would have associated that pattern with Retroduction, a type of reasoning that few seem equipped to do (CP 2.180; Chiasson & Tristan 2007).

Yet, Peirce’s comment that *true science is distinctively the study of useless things* may still seem silly until one begins to explore what he means by the word *useless*. While it is true that some individuals pursue arguably useless activities (such as memorizing phone books or mentally computing days of the week, and so on), these are not the sort of useless things that Peirce means. Peirce makes both of his statements about *uselessness* within in the context of continuity and science, *true science* in particular. And, by the word *useless*, he means something that only *seems* irrelevant, because its use has not yet been recognized and/or generally accepted.

Each concept implied by Peirce’s *rare minds/useless things* statement comprises some element in his overall philosophical construct. Some, such as Retroduction and Continuity/Fallibilism are major concepts; the natures of both rare and not so rare minds derive from Phenomenology (CP 1.377–78). Although inexorably tied together, the brief descriptions of each that follow may seem to belie that connection.

True Science

A. Retroduction

What sets it apart from all other kinds of science, claims Peirce, is that *true science* is the science of discovering new hypotheses and, as such, requires the logic of Retroduction. His point is that the aim of *true science* is not to solve a specific problem but to *follow* a problem, an idea, or an anomaly wherever it

leads. Sometimes useful things pop out along the way, but usefulness is not as the aim of inquiry (CP 5.436). One cannot know in advance whether following and unfolding the meaning of a particular anomaly will lead to anything useful. If usefulness does result, it may be that the use of a particular discovery will only emerge many years hence.

Peirce's *true science* requires a particular sort of inquiry undergone by a particular sort of thinker, who applies a particular set of methods.⁴ Retroduction, which engages this set of methods, is the only sort of reasoning that can result in the discovery and development of a new hypothesis (CP 6.475; Peirce Edition Project 1998: 131).

Retroduction is a complex and recursive process that begins with a suggestive and "extremely fallible" insight derived from phenomenological exploration. Although fallible, this insight can result in an original idea born of a suggestion that "comes to us like a flash" (CP 5.181).⁵ Yet paradoxically, Peirce identifies the first step of the Retroductive process, that of getting a hunch (abduction), as a function of the unconscious: "[O]ur first premisses, the perceptual judgments, are to be regarded as an extreme case of abductive inferences", writes Peirce, "from which they differ in being absolutely beyond criticism" (CP 5.181).

Yet, Peirce insisted that reasoning is a species of controlled conduct (CP 1.610), which unlike the hunch-getting stage, is subject to praise or blame. He also said "... self-control of any kind is purely inhibitory. It originates nothing". Thus, Peirce claims self-controlled reasoning cannot originate a new idea – paradoxically placing the initial abductive insight for getting a hunch that leads to the formulation of a hypothesis outside of normative science. Peirce also says:

Where does the conception of inference itself come from? That is the only difficulty. [S]elf-control is the character which distinguishes reasonings from the processes by which perceptual judgments are formed, and self-control of any kind is purely inhibitory. It originates nothing. Therefore it cannot be in the act of adoption of an inference, in the pronouncing of it to be reasonable, that the formal conceptions in question can first emerge. It must be in the first perceiving that so one might conceivably reason. (CP 5.194).

Thus, it is that this writer suggests that the sort of extreme Abduction that Peirce describes (which stems from subconscious perceptual judgment) really is the

⁴ Ecological Researcher, E. David Ford, lays out the complex method of Retroduction in his book *Scientific Method for Ecological Research* (2000).

⁵ Peirce seems to apply two distinct and hierarchal meanings of the intertwined concepts that he variously called *abduction* and *retroduction*. This essay uses the term *abduction* to refer to the third form of logical inference, which, unlike either deduction or induction, introduces a new idea. Retroduction is reserved for the form of a deliberate and overarching logical method that incorporates abduction, deduction, and induction for the development of a hypothesis capable of explication, demonstration and testing. (Chiasson 2005; CP 5.581).

whole of Abduction.⁶ This subconscious abductive process is then a vital aspect of the complex and recursive logic of Retroduction, rather than a synonym for the latter (Chiasson 2005). In this sense, an abductive inference would be the first stage of a “whole series of mental performances between the notice of the wonderful phenomenon and the acceptance of the hypothesis” (CP 6.469). This whole series of mental performances includes deductions and gradual inductions, especially qualitative inductions (CP 2.759). For, as Peirce writes:

As for retroduction, it is itself an experiment. A retroductive research is an experimental research; and when we look upon Induction and Deduction from the point of view of Experiment and Observation, we are merely tracing in those types of reasoning their affinity to Retroduction. (CP 5.581).

Thus, true science, which is undergone retroductively, is generative. As such, its teleological focus is different from other scientific pursuits. In true science, goal (or hypothesis) generation is preliminary, meaning that goals themselves may change and/or grow based upon discoveries and the results of experimentation along the way.

Although it recursively incorporates abduction, deduction and induction (CP 5.581), the full generative and experimental process of Retroduction, impelled by Abduction, is the only method that qualifies as *true science*, as this is the only system by which new discoveries can occur. For, new scientific hypotheses emerge by means of the sort of objective chance, anomaly or novelty that initiates an abductive inference, which then impels Retroductive reasoning (Chiasson 2005). In other words, Retroduction as the distinctive method of *true science* operates by means of developmental teleology (Hulswit n.d.). Its focus is on evolving and honing hypotheses, rather than merely demonstrating or testing them (CP 6.470–73).

Useless Things

B. Continuity and Fallibilism

Although Peirce’s idea of *useless things*, resides within his doctrine of Continuity, inseparably bound together with his doctrine of Fallibilism (CP 1.163), this

⁶ Even if abduction is unconscious, it is not necessarily a non-normative process. For, the pattern of actions leading to getting a hunch can be observed (Chiasson & Tristan 2012; Chiasson, Malle & Simmons 2003). In the not too distant future, it is likely that by simultaneous measurement of the abductive-like process by means of the task-based manipulative assessment and of brain wave patterns could provide a basis for norming the unconscious aspect of abduction.

chapter (due to length constraints) will address these significant concepts only tangentially.

Continuity holds that everything “swims in a continuum of uncertainty and indeterminacy” (CP 1.171); fallibilism, that our knowledge can never be absolute. Thus, everything, including every idea that was, is and might be, is continuous. “There is no such thing as an absolutely detached idea”, says Peirce. “It would be no idea at all. For an idea is itself a continuous system. But of ideas those are most suggestive which detached though they seem are in fact fragments broken from great systems”.⁷ The statement, from Peirce’s 1898 lecture on *The Logic of Relatives*, hints at what he means by the study of useless things; suggestive ideas that seem detached, but are in truth “fragments broken from great systems”. Such was the study of conics, dismissed by Descartes as useless; such is much of Peirce’s body of work, obscure during his life and still not fully described, understood or applied even now, one hundred years since his death.

An apparently *useless thing*, therefore, appears as a discontinuity, an unrelated and useless finding because its potential is not (or cannot yet be) recognized (Peirce 1992: 261–630). In this sense, uselessness is a judgment that violates the principles of Continuity/Fallibilism. The judgment of uselessness also interferes with the basic processes and principles of Retroduction, which relies upon discontinuities within the continuum for source material.

Rare Minds

Peirce’ Doctrine of Categories (Phenomenology) and Subconscious Thinking Patterns

What is it that rare minds can do that makes them so rare? How do they differ from conventional minds? Do rare minds have a better grasp of deliberate reasoning skills than others have; is that what makes them rare? If so, can educating conventional minds in the art of reasoning create rare minds? (Chiasson out for review)

⁷ Peirce, C. S. (1932). *Principles of philosophy and elements of logic*. In C. Hartshorne & P. Weiss (Eds.), *Collected papers of Charles Sanders Peirce*, Vols. I-II [electronic edition]. Cambridge, England: Belknap Press of Harvard University Press. Retrieved from <http://www.nlx.com/collections/95>

This final section will suggest that, just as phenomenology informs formal logic, the operation of a conscious mind (rare or not) depends upon the habitual way in which that mind relates to phenomena (CP 5.181; Chiasson & Tristan 2012).

Peirce insisted that reasoning is a species of controlled conduct (CP 1.610); he also said "... self-control of any kind is purely inhibitory. It originates nothing". (CP 5.194) Instead, original concepts emerge from a particular pattern of engaging with phenomena. Yet, everyone perceives phenomena, even conventional minds.

If it is from phenomenological explorations that abductive inferences emerge, how do *rare minds* undergo such explorations? And, how does the manner in which they explore differ from the ways in which conventional minds interact with phenomena?

Although he did not define specific operations of minds (rare or otherwise), Peirce did propose an application of his three phenomenological categories to psychology. He identified these categories in terms of human consciousness as follows (CP 1.377):

1. Feeling and/or passive consciousness of quality without recognition or analysis
2. Recognition of an interruption of the field of consciousness (recognition of an external fact or of something else outside one's self; a sense of resistance)
3. Synthetic consciousness (thought, sense of learning, binding time together)

Now, suppose that each of these categories of consciousness can be shuffled into different orders, in much the same shuffle that Peirce describes in terms of inference types (Peirce 1898: 148). Next, suppose that different minds engage with phenomena in predicatively different ways. These differences would derive from factors such as:

- An individual's innate *teleological perspective* (e.g. immediate, short/medium range, long-range, generative/*developmental*, overarching).
- The person's *duration pattern* (the pattern of regularity and irregularity based upon the *relative amount of time* he/she habitually engages with each phenomenological category).
- The degree of *intensity* with which he/she habitually confronts options (e.g. shallow, low, moderate, high)
- The person's habitual pattern of *sequencing thoughts* (*direction & order*), e.g. splayed, linear, multi-directional/goal-directed, multi-directional/reticulated (Davis 1972; Chiasson & Tristan 2012).
- Particular ways of habitually combining these factors produce predictable, observable and measurable processes (and subsequent generic effects) for each way of engaging the three categories (Davis 1972; Chiasson & Tristan 2012).

Abductive-like thinkers (9%–11%)⁸

Teleological Perspective: Developmental/Generative

Phenomenological pattern:

- Spends most time exploring qualities (Firstness)
- Responds to effects of exploration, e.g. anomalies, unique qualities, relevant new options, as they arise (Secondness)
- Thirdness usually experienced as synthesis leading back to more exploration and its effects. Sometimes a unique &/or unusual outcome is produced, but just as often there is no representation at end of process.

When they have a choice, people who think in this unusual way prefer spending most of their time engaging with the qualities of Firstness and secondarily, comparing and contrasting options from reactions of Secondness. While synthesis occurs throughout their process, it is not an ending point, but fodder for new acts of comparisons and contrasts from which they derive new qualities for exploration, which in turn can result in new syntheses. Theirs is a reticulated (web-like) process from which ideas emerge, evolve and change.

Deductive-like thinkers (18%–22%)

Teleological Perspective: Fixed long-range goal directs development/performance of sub-goals

Phenomenological pattern:

- Low to moderate engagement with Firstness in course of selecting overall goal
- Moderate to significant engagement in Secondness; does a good deal of comparing/contrasting to select most appropriate options for goal.
- Most effort spent in planning, preparing & representing goal (Thirdness).

In contrast to Abductive-like thinkers, those who apply a Deductive-like process formulate a general goal relatively quickly and (with rare exceptions) initially spend little time exploring the qualities of Firstness and move instead into the comparative/contrasting process of planning (Secondness). However, when they meet with resistance in the course of achieving an outcome, (say in the form of a problem, a need to gather information, a sub-goal for which they had not planned, and so on), they will return to the first category to graze among options

⁸ These percentages are based upon the Oregon study of the DNV assessment of inferencing patterns (Chiasson *et al* 2002–03) and upon percentages from sets of contexts (e.g. mgmt., sales, risk assessment, education, drug & alcohol rehab, criminal justice, etc.) for which the assessment has been applied since 1978.

for a time. Once they have examined sufficient options for a given purpose, they will compare and contrast those options to choose the one most appropriate for the desired outcome. Thus, although their process is complex, their engagements with qualities and their acts of comparing and contrasting are in service to a preconceived outcome. Granted their long-term aim is complex and sub-goals are open to revision, but the long-range goal is not.

Crude Inductive-like thinkers (65%–70%)

Teleological Perspective: Clear, replicative goals directly attached to method for achieving these (recipe & protocol-driven)

Phenomenological pattern:

- Does not explore options (Firstness).
- Does not compare/contrast to choose best option & does not trouble-shoot (Secondness).
- Selects (or copies) and represents simple, familiar goals (Thirdness).

These sorts of thinkers do not engage with the qualities of things, except in a superficial sense. They scan for familiar options, rather than explore alternative possibilities or expend energy analyzing or seeking the most appropriate choice. They focus primarily upon producing familiar content and/or following rules, directions and protocols. They do not reason *per se*. Instead, they rely upon previous experience and/or upon the dictates of authority. From these sources, they apply crude inductions, preferring familiar patterns and repetitive processes to progressive ones.

Crude Abductive-like (transient) thinkers (3%–9%)

Teleological Perspective: Randomly selected goals based on simple variety (not anomaly-just different from what was done just before)

Phenomenological pattern:

- Randomly selects (does not explore) options (Firstness)
- Does not compare/contrast to choose best option & does not trouble-shoot (Secondness)
- Produces or represents haphazardly (Thirdness).

Simple variety and expedience are the aims of this sort of thinking. We have seen a low percentage of individuals who habitually think in this way 3–9%, depending upon context. Because they are so flexible however, they have been much more likely (with intervention) to develop a more complex pattern than are the highly certain (and often successful) individuals who habitually operate by means of crude induction.

Retroductive-like thinkers

Teleological Perspective: Overarching

Phenomenological pattern: Deliberate interplay of all three categories as suggested by aim

These are probably the *rare minds* to whom Peirce refers. Unlike most people, they are capable of *deliberate* reasoning in abductive, deductive and inductive modes and of knowing when to do which. It is likely that Peirce's rare minds would need to possess a combination of innate Abductive-like and Deductive-like capabilities; they would even need to be willing to engage in the often tedious repetition of Gradual Induction when the need is clear (something that purely Abductive-like thinkers find abhorrent). They even recognize that exceptions to the *always* and *never* conclusions of Crude Induction provide them with fodder for new explorations. They can engage any pattern as needed for whatever stage or phase of inquiry they have reached. Like Abductive-like thinkers, they easily synthesize information into results, but unlike purely Abductive-like thinkers, they eventually produce results capable of analysis and testing. Retroductive minds engage in recursive and unpredictable patterns of discovery, explication and preliminary verification as they select and reject among goals, methods and materials based upon what they learn along the way. When encountering new information and the discovery of new facts, these rare and generative minds will always make warranted adjustments, even if doing so means changing or abandoning a cherished hypothesis.

Since it is theoretically possible for anyone who habitually operates from any pattern to develop skills of retroductive thinking (Davis 1972), it would be difficult estimate how many people are actually capable of doing this. However, unlike Crude Inductive-like thinking, Retroduction can be cumbersome and economically unproductive (just consider Peirce and his economic struggles). Thus, it is unlikely that many would make the effort required to learn to deliberately reason in this way.

Summary

A *useless thing* might not be useless somewhere within or along the great Continuum; Fallibilism holds that, lacking omnipotence as we all do, we cannot identify uselessness anyway (except, perhaps for a given immediate context – but even then, not for sure).

True science is the science of discovery undergone by means of Retroduction, of which Abduction is an aspect.

Peirce's *rare minds* are probably, at the least, Abductive-like and, more likely, Retroductive thinkers. In any case, they are people comfortable pursuing apparently useless things because they go wherever facts and implications lead them. They are certainly not slaves to the dictates of a fixed goal, whether long or short range. Nor do they allow the already known to blind them to what may be. They are not cowed by the declarations of authority or by preconceived notions of plausibility.

David L. O'Hara¹

29 The Heart as a Perceptive Organ

No, as to God, open your eyes – and your *heart*, which is also a *perceptive organ* – and you see him. (CP 6.493, 1896).

This whole provocative sentence seems to run contrary to what common sense would tell us. First of all, there does not seem to be anything like universal agreement that God – whatever that word means – is apparent to our eyes. Second, it is similarly not apparent that our hearts – again, whatever might be meant by that word – are the organ of perception to which we may appeal as giving any kind of authoritative statement about what may really be found in the world.

It will perhaps be surprising, then, to discover that for Peirce this was not a dogmatic pronouncement about religion but a statement about properly scientific inquiry, or what he later called inquiry in “scientific singleness of heart”. The sentence comes from a manuscript of Peirce’s written sometime around 1896,² when Peirce was working as a consulting scientist and in a period of his life when he was working on several texts on logic and scientific method. As unscientific as the sentence sounds, it expresses one of Peirce’s key ideas in the logic and ethics of inquiry: aesthetics is one of the normative sciences, and sentimentalism (as Peirce understood that term) is properly a part of inquiry (EPI: 356).

In the fifth of his 1903 Harvard lectures on Pragmatism, Peirce argued that there are three normative sciences: aesthetics, ethics, and logic. Since logic aims at discovering the truth, it must be governed by an ethic of inquiry, one that keeps prejudice from determining the ends of reasoning. Our deliberate ethical ends are the ones we have considered worthy of pursuing. As Peirce puts it, “Ethics is the study of what ends of action we are deliberately prepared to adopt” (EPII: 200). When we consider ethics in this way, it quickly becomes apparent that much depends on what could prepare us to adopt any given end, leading Peirce to say that the morally good is a species of the aesthetically good. Our deliberate ethical choices are ultimately ones we find admirable. This is not so much an argument for making ethics relative to individual interests as an observation of how reasoning really works. Either we must choose certain ends as good because we cannot choose otherwise, or else we have some freedom to choose those ends, in which case we appear to be making an aesthetic appeal.

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² MS 860 also published in CP 6.493, and Buchler 1955, 377–78.

This may seem counterintuitive, but a little reflection shows us that the most rigorous scientific inquiry always begins with someone choosing which ends are to be pursued. That choice is always informed by our sense of what research feels most worthy of our energies. This is part of why Peirce defends what he calls “sentimentalism”. For Peirce this is not a pejorative term, but “the doctrine that great respect should be paid to the natural judgments of the sensible heart” (EPI: 356).

We recoil from this position because it seems it must undermine science by claiming that science boils down to mere aesthetics, but this is not at all the case according to Peirce. Science needs aesthetics just as surely as any human action needs aesthetics, because without a choice of ends to pursue there is no action. But the pursuit that follows is not therefore reducible to that initial choice. Peirce confessed that his own heartfelt beliefs would “probably shock my scientific brethren”, adding that “the strong feeling is in itself . . . an argument of some weight . . . so far as it may be presumed to bespeak the normal judgment of the Sensible Heart” (EPI: 357).

If it turns out that our hearts, our instincts, and our aesthetic sense direct us towards one end or another, this does not mean we must adopt that end. The articulation of the heart’s judgment is an *argument*, but taken by itself it is not an *argumentation*. Peirce distinguishes between these by saying that “an ‘Argument’ is any process of thought reasonably tending to produce a definite belief. An ‘Argumentation’ is an Argument proceeding upon definitely formulated premises” (CP 6.456). The heart may produce beliefs, but those beliefs don’t count as proofs. Those beliefs provide us with the starting-points of our inquiries.

Peirce thinks it is obvious that the heart plays another important role in science, because science is not the pursuit of an individual working in isolation but of a community, to which our hearts draw us by the “social impulse”. In one of Peirce’s earliest essays, “The Fixation of Belief”, published in 1877, Peirce cautions against thwarting the work of science either by failing to attend to the social impulse, or by giving the heart too much authority, allowing comfortable beliefs to terminate the discomfiting pursuit of truth. We are driven to work together in community by a matter of the heart, the social impulse, the drive to get along with our neighbors. And we are also driven to working in community by another matter of the heart, namely the irritation of doubt that arises when we encounter opinions contrary to our own. These two facts illustrate two important points concerning the ethics of inquiry. First, sentiment should not be ignored, because it may provoke us to our best research. Second, sentiment should also not be allowed to close down inquiry, as it does when someone wishes to end an investigation based on a gut feeling or a hunch.

One good reason to allow the heart to have some authority in deciding which ends we will pursue is to avoid giving undue credence to an authority that will close off inquiry. Several times in his *Collected Papers* Peirce mentions a medieval disputation about the Eucharist, in which Lanfranc of Canterbury wished to end the discussion with an appeal to authority. After all, according to the reasoning of the time, each premise in an argument must either come from another argument or else from an ultimate authority. This means that ultimately, all reasoning rests on authority. Peirce found the words of the other disputant, Berengar of Tours, to offer a more scientific position. Berengar argued that the decision to trust an authority is itself a decision based on some kind of reasoning. That reason might not constitute a logical deduction, but an example of the heart's reasoning, or *scientia cordis*, akin to what Peirce later called "the just authority of instinct" (EPII: 472). Unlike ecclesiastical or political authorities, which sometimes may not be questioned, we stand in a special relation to instinct: it directs us, but not irresistibly, and we may both inquire into its causes and reject its decisions through self-control.

Some have argued that there is a "wisdom of repugnance", and that certain moral questions may be answered by an appeal to our sense of repugnance.³ Given several options, the repugnant ones may be rejected as not only aesthetically repugnant but also morally repugnant. While Peirce's logic of abduction and his insistence on the importance of aesthetics in inquiry endorses the importance of including the heart's inclinations in our ethical and scientific inquiries, Peirce explicitly rejects making our heart-sense of an issue the end of the discussion. The heart's perception is the explorer glassing the horizon, searching for signs of land, but it is not the land itself. Science comes in our choosing to land, and in the exploration of what the heart has initially discovered.

Now let us examine the second part of Peirce's claim, concerning God. It might seem that religious belief is just the kind of belief that must shut down inquiry, but Peirce argues that this is not *necessarily* the case. The connection between inquiry, the heart, and belief in God's reality is illustrated in one of Peirce's latest works, his "Neglected Argument for the Reality of God". Twice in that essay, Peirce uses the idiosyncratic phrase "scientific singleness of heart" to describe the proper attitude of those inquiring into the reality of God. The person who approaches the question hoping to be persuaded of God's reality does not practice scientific singleness of heart. Similarly, someone who is unwilling to pursue the question of God to its end and who prejudicially refuses to be stirred

3 Cf. Kass, Leon. *Life, Liberty, and the Defense of Dignity*. (San Francisco: Encounter Books, 2002) 150–153, e.g.

by the possibility also does not inquire in scientific singleness of heart.⁴ The point is simply this: scientific inquiry arises from a “desire to find things out”, so deciding in advance what the outcome of the investigation must be – that is, deciding in advance what will be “found out” – is absolutely opposed to the spirit of science (Buchler 1955: 4). To put it in other Peircean terms, prejudice is opposed to the first rule of logic – i.e., in order to learn one must desire to learn – and to its corollary, “do not block the path of inquiry” (EPII: 47).

Peirce approached the question of God with the same logical care he brought to his other researches. On the one hand, he was not keen to advocate the creeds of various churches, since he regarded most creeds as designed to exclude people from the community or to block the path of inquiry.⁵ On the other hand, Peirce argued for as inclusive a community of inquiry as possible; and he held that “pretty nearly everybody” believes in the reality of God, “including the scientific men of my generation who are accustomed to think the belief is entirely unfounded” (Buchler 1955: 375). No doubt this would surprise those scientific men, but Peirce attributed this to a common mishandling of the term “God”. When “God” is commonly defined, the word is made to be too precise, as though it designated something clearly understood and not at all vague. If we approach religious meditation and inquiry in “scientific singleness of heart”, allowing it to develop spontaneously and without prejudice, we will find the idea of God as “Creator of all three Universes of Experience” to be an attractive idea, one that grows in beauty and persuasiveness. Peirce doesn't see this as a distraction from inquiry into the natural world. It is precisely the endorsement of that inquiry, both by offering the hypothesis that inquiry will be fruitful because there are real and discoverable natural relationships in the world, and by endorsing the broadest sort of love for our neighbors, leading to a greater community of inquiry. Peirce writes,

⁴ Peirce also uses the phrase “singleness of heart” to describe a properly scientific approach to reasoning in CP 2.123 and 7.51.

⁵ Cf. Peirce's note in his essay “The Fixation of Belief”, where he writes that “Every distinctive creed was as a historical fact invented to harm somebody”, (CP 5.380, cf. CP 6.450) and his essay “The Marriage of Religion and Science”, where he writes that “Thus it happens quite naturally that those who are animated with the spirit of science are for hurrying forward, while those who have the interests of religion at heart are apt to press back” (CP 6.430). But he did not tar all religious belief with that brush, advocating the Gospel of Love over greed (in his 1890 *Open Court* essay, “Dmesis” and in EPI: 352–371) and suggesting that St Paul's first Epistle to the Corinthians contained a summary of the virtues of reason (EPI: 150–1).

Man's highest developments are social; and religion, though it begins in a seminal individual inspiration, only comes to full flower in a great church coextensive with a civilization. This is true of every religion, but supereminently so of the religion of love. Its ideal is that the whole world shall be united in the bond of a common love of God accomplished by each man's loving his neighbour. Without a church, the religion of love can have but a rudimentary existence; and a narrow, little exclusive church is almost worse than none. A great catholic church is wanted. (CP 6.442–443).

Where religion is exclusive, there is no love; where there is no love, there can be no community of inquiry; and where there is no such community, science cannot flourish. "When we consider that logic depends on a mere struggle to escape doubt, which, as it terminates in action, must begin in emotion, and that, furthermore, the only cause of our planting ourselves on reason is that other methods of escaping doubt fail on account of the social impulse, why should we wonder to find social sentiment presupposed in reasoning?" (EPI: 150–1) So in religion there can be no infallible opinions and no exclusions, except for the exclusion of exclusiveness. Unquestionable authority will not do. We ought not call "the prayer that bursts from the heart of a shipwrecked sailor 'a theology'" if we think of theologies as unquestionable. (EPII: 452) But neither should we dismiss his heart's search for improbable rescue or the sailor's willingness to find rescue arriving in an unanticipated way as unscientific. To do otherwise is to prejudicially shut down avenues of problem-solving. In a sense, this is what the love of God means: openness to unanticipated ideas, and an unwillingness to rest upon one's predispositions or habitual beliefs. This love of God, practically expressed in love of neighbor, makes inquiry possible, and where there is greater love, there is greater community. What is wanted is the greatest possible community, which calls for the greatest possible love.

After all, it is not obvious that science *should* progress, nor that inquiry should occur at all, except inasmuch as it is obvious to the heart. This is why Peirce writes of God that "one can only know Him by direct perception" (CP 6.613). We do research because we find it compelling to do research. We must appeal to the heart.

Iris Smith Fischer¹

30 On the “realistic hypostatization of relations”

The work of the poet or novelist is not so utterly different from that of the scientific man. The artist introduces a fiction; but it is not an arbitrary one; it exhibits affinities to which the mind accords a certain approval in pronouncing them beautiful, which if it is not exactly the same as saying that the synthesis is true, is something of the same general kind. The geometer draws a diagram, which if not exactly a fiction, is at least a creation, and by means of observation of that diagram he is able to synthesize and show relations between elements which before seemed to have no necessary connection. The realities compel us to put some things into very close relation and others less so, in a highly complicated, and to the sense itself unintelligible, manner; but it is the genius of the mind, that takes up all these hints of sense, adds immensely to them, makes them precise, and shows them in intelligible form in the intuitions of space and time. Intuition is the regarding of the abstract in a concrete form, by the realistic hypostatization of relations; that is the one sole method of valuable thought. (W6: 187, 1887).

In late 1887 and early 1888, when Charles Sanders Peirce was drafting Chapter IV of “A Guess at the Riddle,” he was also writing about theatre and performance. Peirce’s wife Juliette had studied with the playwright, actor, and director James Steele Mackaye (1842–1894), and Peirce hoped to see her perform on the New York stage. Mackaye’s approach to actor training drew on the speculative philosophy of his teacher, François Delsarte. In his unfinished essay “Trichotomic” (probably drafted in early 1888), Peirce noted with interest Mackaye’s triadic account of the actor’s task, which involves the use of three capacities (sensation, perception, and affection) to represent the corresponding categories as they are experienced in human life. Peirce did not take up Mackaye’s triads or the speculative philosophy behind them. Yet, as Peirce notes in the above passage from “A Guess at the Riddle,” the artist’s aesthetic task struck Peirce as notably similar to that of the scientist’s “genius of the mind.” In these documents, Peirce seems to treat intuition as a theatrical scene involving a double-sided act of creation.

At this time, Peirce is shaping his categories of life and experience in terms of a Kantian “architectonic structure” and an on-going review of the pre-Socratic philosophers on the riddle of what the world is made of, i.e., its primal matter (Houser in W5: xl). In Chapter IV, on psychology, he finds that cognition, a type of thirdness, is informed by feeling (firstness) and sensation (secondness).

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Peirce's comments on the "realistic hypostatization of relations" provide insight into the role of intuition in cognition. The editors note, "As defined here, intuition is not the immediate, asemiotic cognition Peirce attacked in his 1868 articles, but the active contemplation of a diagram, i.e., of a concrete representation of abstract relations, likely to display new connections that had gone unnoticed until then" (W6: 448). Peirce's account of intuition in "Guess" points to his later formulations. T. L. Short notes that by the 1890s, "Peirce found the dyadic element throughout all experience, even perceptual" and adds, "perception, then, is not wholly passive" (78). In "Guess" he is already careful to distinguish between the "degree of force" with which the quality of feeling occurs and the experience of feelings, which involves what he calls "haecceity", after Duns Scotus, or the here and now of relations in secondness (Short: 77–78). As the "active contemplation of a diagram," intuition lays claim to both firstness and secondness. In 1904 Peirce will call this "a double consciousness" – the intertwining in cognition of action and perception (CP 1.324).

My quote from "A Guess at the Riddle" appears in the final paragraph of Peirce's account of psychology. As in other chapters, he considers the categories broadly, then parses them through both genuine and degenerate forms, in this case focusing on "synthetical consciousness" (W6: 186). The second degree of degeneracy consists of "think[ing] different feelings to be alike or different . . . since feelings in themselves cannot be compared and therefore cannot be alike" (W6: 187). To make use of such feelings, the mind is compelled either internally or externally to "synthetize or sunder them." In "the highest kind of synthesis," though, the mind is compelled by neither "the inward attractions of the feelings" nor "a transcendental force of haecceity" but "the interest of intelligibility." The mind, which Peirce refers to as the "I think," "introduc[es] an idea not contained in the data, which gives connections they would not otherwise have had" (W6: 187). He proceeds to offer examples of the varieties of synthesis and their "intimate relationship."

How is the "work" of the poet or novelist like that of the scientist? At first, Peirce seems to use the word in its usual sense: "work of art." The creative writer's work is a fiction; it "exhibits affinities" that are "not arbitrary." Peirce is no believer, though, in intrinsic qualities in literature; it is not the text itself but the mind that "accords a certain approval in pronouncing them [the affinities] beautiful." The "I think" – a phrase that in its deflection from the "self" might characterize the reader as well as the author – in approving this beauty engages in a kind of synthesis, but not a kind that allows a truth to be proven. That kind would constitute the consciousness of a process, of cognition itself. Where exactly the beautiful affinities lie in the relationship between author, text, and reader is not specified. What is clear is that the affinities are a type of firstness,

a potential that contributes to the introduction of a new element in the mind. The appearance of beauty (which Peirce associates with the nature of literature) lies somewhere in what he calls the “work”.

The meaning of “work” becomes clearer in Peirce’s next sentence, where he suggests a parallel with the “geometer” who “draws a diagram” and observes it. The scientific man “is able to synthesize and show relations between elements which before seemed to have no necessary connection.” In this kind of consciousness, creating is accompanied by observing, which is to say that the geometer’s work involves a double role. Peirce does not mention the reader, but the geometer as observer suggests that the reader may also contribute to the work of creating and observing. “Work” in this passage exhibits the diagram’s affinities not in retrospect but in the continued course of its making. The work of intuition is mental and physical activity that involves the creation of something new.

Here Peirce seems to be describing what he calls in “Trichotomic” dual consciousness, involving both outward and inward action and reaction. In terms of the work of creation discussed in “Guess”, action and reaction involve the “taking up” and “showing” of “hints of sense” in “the intuitions of space and time.” This “genius of the mind” contributes to both perception and imagination, as Short notes: “Perception, I suggest, is like a door forced open against our resistance to it (we were thinking about something else or expected something else), while imagination is like a door that we force open against the flood of current sensation (preferring to think of something other than what we are seeing). . . . Every quality of feeling that occurs, whether in perception, memory, or imagination, occurs, then, with a degree of force that elbows out its competitors” (77). So it is with intuition. While the “realities” cannot be accounted for, the writer or scientist is compelled to see them as related. As the W6 editors phrase it, intuition is an *active* contemplation (W6: 448).

Further, intuition as “the regarding of the abstract in a concrete form” is “the one sole method of valuable thought.” What does Peirce mean by the word “valuable”? The word’s context emerges from his characterization of that method as “the realistic hypostatization of relations.” Intuition leads to the growth of reflection and ideas; it is not cognition itself but the best means to it. The *Century Dictionary* definition for “hypostatization”, which Peirce may have authored,² as “the act of hypostatizing, or the state of being hypostatized,” hints

² Cornelis de Waal indicated in a personal communication (24 May 2013) that Peirce’s annotated and interleaved copy of *The Century Dictionary* demonstrates he wrote only definitions 3, 4, and 5 for “hypostasis.” Peirce’s question mark in the margin next to “hypostatization” suggests that he might have authored that definition as well.

at his thinking on the dual nature of intuition. To “hypostatize” is “to attribute substantial existence to: make into or regard as a distinct individual substance or reality” (*Century Dictionary* 2958). Here the making and observing elements of creation are foregrounded. And his first two definitions for the root word, “hypostasis”, are most revealing:

3. In *metaph[ysics]*, a substantial mode by which the existence of a substantial nature is determined to subsist by itself and be incommunicable; subsistence.
4. A hypothetical substance; a phenomenon or state of things spoken and thought of as if it were a substance. (*Century Dictionary*: 2957).

Peirce’s contributions to the definitions of hypostasis show its realist orientation, ranging from the material to the hypothetical and the metaphysical. Each links “substance” to a reality while carefully not equating that reality with the material, or that which exists. Substance may be material, or it may be otherwise. De Waal (2013) asserts that Peirce “extracts the categories from an examination of the phenomenon – an examination that is non-psychological and prelogical. Returning to the phenomena (substance, or the phaneron) distinguishes Peirce’s derivation of the categories from previous attempts” (46).

In geometry, de Waal notes, the mathematician relies on abstraction to provide “material for the hypothetical states of things” (27). In hypostatic abstraction, “we extract a certain aspect from a hypothetical state of things and make it an independent object of thought of which other things can subsequently be predicated.” Mathematical reasoning thus includes “construction, observation, experiment, abstraction, and generalization” (28). To what extent does the philosopher, or the artist, also create an object of reason? To what extent does that object have substance?

Short follows Max Fisch in tracing the development of Peirce’s realism through three phases: early assertions of the reality of “generals”; the development of his ideas on secondness, based on haecceity; and the division of “the reality of generals into two kinds, that of mere possibility or what may be (1sts), and that of potentiality or what would be (3rds)”. This last step cleared the way after 1903 for Peirce to assert the ability of the dynamic object to be available to cognition while existing “independent of our experience” (Short: 199). The high esteem in which Peirce holds intuition is congruent with his realism in 1888. That Peirce was all too aware of the controversy surrounding hypostatization is indicated in the final sentences of Chapter IV, where he remarks, “Very shallow is the prevalent notion that this is something to be avoided. . . . The true percept is not to abstain from hypostatization, but to do it intelligently” (W6: 187). Indeed, many have continued to believe that “the worst

enemy of clear thinking is the propensity to hypostatize” (von Mises), or that hypostatization is a form of reification, and thus by definition a fallacy. Peirce retorts that abstaining from hypostatization constitutes in itself a fallacy, for as he demonstrates intuition can be crucial to both artistic and scientific creativity.

Let us return to Peirce’s reluctance to distinguish sharply between art and science when discussing the work of intuition. In this context the distinction between a fiction and a creation can be seen as less important than it first appeared. The geometer, like the writer, cannot explain what he has created (although the geometer may fret more about it). Peirce continues, “[t]he realities compel us to put some things into very close relation and others less so, in a highly complicated, and to the sense itself unintelligible manner.” What are these realities? Do they differ from art to science? In Chapter IV, Peirce says only that the mind takes up “hints of sense, adds immensely to them, makes them precise, and shows them in intelligible form in the intuitions of space and time.”

In “Trichotomic,” Peirce goes on to discuss types of thirdness in regard to convention-bound performance styles such as Expression, a term he borrowed from Mackaye’s vocabulary of actor training. Expression, Peirce notes, relies *most* heavily on degenerate forms of signification, both iconic and indexical. Signs are degenerate in the first degree when they “demonstrate the reality of things” by drawing the mind’s “attention to the right object” (W6: 212). He provides examples from three types of performance: a staged play, a Sunday church service, and vaudeville or circus entertainment:

So a desired frame of mind on the part of the audience is often brought about by the dramatist in a forcible way by directly affecting the nervous system, without appealing to association; or the attention of the audience may be awakened, as a clergyman shouts out the commencement of a new head to his sermon, or [the audience’s attention at a circus or variety show] may be directed to a particular part of the stage, as the jugglers do. (W6: 212).

The most characteristic form of thirdness for theatre, though, is degenerate in the second degree: that is, a relation of likeness or resemblance. Peirce continues, “[T]he idea in the mind addressed, the object represented, and the representation of it, are only connected by a mutual resemblance. . . [T]he mind floats in an ideal world and does not ask or care whether it be real or not” (W6: 212–13).

Omitted in my last quotation is Peirce’s intervening sentence: “The sign is a likeness; and this is the main mode of representation in all art. Here there is no sharp discrimination between the sign and the thing signified. . . . This character makes a striking point of difference between this kind of representation [degenerate in the second degree] and the second [degenerate in the first degree]; and that is why the use of the second mode of representation [such as

the clergyman's shout] is so unartistic" (W6: 213). But the substantial realities (e.g. the body of the performer) *do* matter to the spectator. They are not purely "unanalytic," as Peirce calls representation in the second degree. Art may "present . . . the total object as it exists in the concrete, and not merely abstract relations and points in that object" (W6: 213), as a conventional sign would. Yet by seeming to restrict theatrical expression to "a kind of representation or signification" (W6: 212), Peirce also seems to discount the ways in which it was designed to operate at all levels – thought, sensation, and feeling. Oddly, in this unfinished essay Peirce seems to cast art as *wholly* fictional. Where is intuition's double-sided act of creation? In "Guess" he suggests that art is bounded by other realities, such as the reality of what "may-be". De Waal maintains that Peirce's realism "holds that also those products of the mind are real that would become an object of a final opinion" (W6: 137). Both science and art rely on the reality (though not necessarily the existence) of possibilities invoked through intuition because they are "grounded not in the individual but the community" (W6: 139). Thus a play, like a diagram or a scientific experiment, has a reality that can be approached only through creation and observation, which leads to that community's opinion.

The involvement of intuition in cognition has been taken up in selected branches of cognitive studies, albeit in very different terms, such as the roles played by body and world in the operations of the brain. In some respects, Peirce's discussion of intuition in "A Guess at the Riddle" resembles Antonio Damasio's account of "map-making minds." In *Self Comes to Mind* (2010), Damasio sketches the mediating role of the body between the brain and the world. Damasio hypothesizes an "as-if body loop" system to explain the mapping of the body in consciousness: "The fact that the body of a given organism can be represented in the brain is essential for the creation of the self. . . . But the brain's representation of the body has another major implication: because we can depict our own body states, we can more easily simulate the equivalent body states of others" (104). According to Damasio, representation leads to simulation, which creates the possibility for empathy. While Damasio identifies the "autobiographical self" as the highest form of consciousness, here he suggests that the mapping effected by mirror neurons goes beyond or perhaps shows an additional dimension to that self – i.e., to an embodied sociality of thought.

In an earlier publication (Fischer 2012) I reflect on Damasio's tendency to treat this embodied sociality of thought in purely representational terms. "Minds emerge," says Damasio, "when the activity of small circuits is organized across large networks so as to compose momentary patterns" (18). He characterizes these patterns as representations. While they operate indexically ("organized across large networks"), his diction casts them as icons – that is, in terms of

similarity rather than contiguity. Thus, “mapping” is not an activity so much as a range of “representational patterns” varying in degrees of refinement and experienced as sensory images. Damasio’s attractive notion of “maps experienced as images” (18) seems to imply a performance in which body and brain both participate. But the sense that Damasio is approaching Peirce’s rich metaphor of the “genius of the mind” quickly disappears: “Because . . . brain maps are the substrate of mental images, map-making brains have the power of literally introducing the body as *content* into the mind process. Thanks to the brain, the body becomes a natural topic of the mind” (89). Here, when body-map becomes brain-topic or idea, both icon and index are absorbed into an abstraction. Does the brain work in isolation from the body, processing it as content? Damasio schematizes iconic and indexical realities as functions of cognition.

What might Peirce’s realist account of the “genius of the mind” add to such discussions? Damasio as nominalist treats the “as-if loop” as a representational activity introduced into “mind process” as a datum or piece of information. Peirce might counter that mapping is an activity that produces a diagram – a creation compelled by realities that cannot be placed exclusively within the brain or in the external world. The reality of the “as-if” relies on the community of investigators who engage in the double-sided act of intuition.

Irving Anellis (1946–2013)

31 Peirce's Role in the History of Logic: Lingua Universalis and Calculus Ratiocinator

Logic, in its general sense, is, as I believe I have shown, only another name for *semiotic* (shmeiwthk⁹), the quasi-necessary, or formal, doctrine of signs. (CP 2.227, 1897).

In his algebra of relatives, Peirce introduced the concept of truth-functional analysis, defining in particular his relation \rightarrow such that the expression " $a \rightarrow b$ " is defined as being true whenever b is true, and false only in case b is false while a is true, that is, as material implication. With this, Peirce explicitly introduced into formal logic the concept of syntactic truth, or validity, which we understand as truth invariant with respect to the extra-logical references of the terms of the proposition " $a \rightarrow b$ ". Considering the matter in greater detail, we note that in the manuscript "On the Algebraic Principles of Formal Logic" written in the autumn of 1879 – the very year in which Gottlob Frege's (1848–1925) *Begriffsschrift* appeared, Peirce (W4: 23) explicitly identified his "claw" as the "copula of inclusion" and defined material implication or logical inference, illation. From there he immediately connected his definition with truth-functional logic, by asserting (W4: 23) that:

This definition is sufficient for the purposes of formal logic, although it does not distinguish between the relation of inclusion and its converse. Were it desirable thus to distinguish, it would be sufficient to add that the real truth or falsity of $A \rightarrow B$, supposes the existence of A .

The following year, Peirce continued along this route: in "The Algebra of Logic" of 1880 (W4: 170), where $A \rightarrow B$ is explicitly defined as " A implies B ".

In the manuscript fragment "Algebra of Logic (Second Paper)" written in the summer of 1884, Peirce (W3: 111–115) reiterated his definition of 1880, and explained in greater detail there (W3: 112) that: "In order to say "If it is a it is b ", let us write $a \rightarrow b$. The formulae relating to the symbol ' \rightarrow ' constitute what I have called the algebra of the copula. . . . The proposition $a \rightarrow b$ is to be understood as true if either a is false or b is true, and is only false if a is true while b is false".

It was at this stage that Peirce undertook the truth-functional analysis of propositions and of proofs, and also introduced specific truth-functional considerations, saying that, for **v** the symbol for "true" (*verum*) and **f** the symbol

for false (*falsum*), the propositions $\mathbf{f} \prec a$ and $a \prec \mathbf{v}$ are true, and either one or the other of $\mathbf{v} \prec a$ or $a \prec \mathbf{f}$ are true, depending upon the truth or falsity of a , and going on to further analyze the truth-functional properties of the “claw”.

In its formal sense, what I have called the formal or syntactic aspect of Peirce’s semiotics is *logical critic*, the analysis and articulation of formal deductive reasoning, what in the traditional Aristotelian terms is the analytic of arguments. It is the “science of the sheer Form of thought in general” (W1: 164).

Thus, it is now made entirely explicit that the truth or falsity of a proposition is dependent exclusively and wholly upon the structure of the proposition, that is, upon the definition of the connective or relation and the truth of the terms (or relata) of the proposition. Peirce explained that, in asserting that logic is semiotic in the sense of being “quasi-necessary or formal”, he understands that it is concerned with signs and their character, which we consider through abstraction. This is precisely how Hilbert’s remark was meant to be understood, that “Man muss jederzeit an Stelle von Punkten, Geraden und Ebenen Tische, Stühle oder Bierseidel sagen können” (Blumenthal: 403). It forms the basis of the formalist philosophy of mathematics, that the syntactic structure of propositions, determined by the definitions, axioms, and logical inference rules of a mathematical system, are the basis for the validity of the formulas (or propositions) derived within that system. That is, “logic proper is the formal science of the conditions of the truth of representations . . .” (CP 2.229). The logician is interested in the “formal responsibility” for the truth of propositions; hence: “The question for him is: What is the nature of the sort of sign of which a principle variety is called a proposition, which is the matter upon which the act of judging is exercised?” (EPII: 292). The difference between a formula and a proposition for Peirce is that the former makes no commitment to extra-logical assumptions about the truth which it expresses, in Peirce’s words, “carries no positive truths”, but “must hold in *any* universe” (EPII: 382, my emphasis).

For Peirce, the three subdivisions of semiotic, or the theory of signs, included, along with syntactics, semantics and pragmatics. The latter is concerned with the relation of signs to interpreters. Modern mathematical logic, to the extent that it is formal in the Hilbertian sense, dismisses pragmatics, relegating it to the realm of psychologistic philosophies of logic or the concern of psychology, rather than of logic properly so-called. Semantics, however, is a critical component of modern logic.

The semantic component of Peirce’s algebra of relatives rests upon the concept of the *universe of discourse* first formulated by Augustus De Morgan (1806–1871), who was the first to introduce the concept of a universe of discourse, or, as he termed it, a “universe of a proposition, or of a name” that, unlike the fixed universe of all things that was employed by Aristotle and the medieval logicians,

and remained typical of the traditional logic, “may be limited in any manner expressed or understood”. The concept was subsequently borrowed by George Boole (1815–1864), who in *The Mathematical Analysis of Logic*, used algebraic symbols to represent classes and members of classes, without, however, using De Morgan’s terminology (Boole: 5). He called the entire universe of discourse 1 and the empty or null class 0, and under the appellation *the Universe*, he understood it “as comprehending every conceivable class of objects whether actually existing or not . . .” (Boole 1847: 15).

Peirce (MS 493) defined the *universe of discourse* as “aggregate of the individual objects which “exist”, that is are independently side by side in the collection of experiences to which the deliverer and interpreter of a set of symbols have agreed to refer and to consider”. The extensional conception of a universe of discourse, comprised of individuals and classes, was adopted by Peirce partially from De Morgan, but also partially from Mitchell, who added the concept of *dimensionality* to De Morgan’s universe (CP 2.536). Underlying the semantic interpretation of a universe of discourse for Peirce was the ontological commitment to individuals and the classes which to they belong. The inhabitants of the universe of discourse may be physical, determined by experience, through the senses; or they may be imaginary, as populated by the contents of a work of art. As Peirce (CP 2.536) wrote: “In every proposition the circumstances of its enunciation show that it refers to some collection of individuals or of possibilities, which cannot be adequately described, but can only be indicated as something familiar to both speaker and auditor. At one time it may be the physical universe of sense, at another it may be the imaginary “world” of some play or novel, at another a range of possibilities”. This suggests that, for Peirce, like Hilbert, the universe of discourse is chosen at will, and depends upon the particular circumstances of the discourse. In other words, the propositions of logic with which one deals may be propositions concerning either tables, chairs, and beer mugs, or points, lines, and planes. What is subject to change is the semantic interpretation of a logical system; what remain unchanged are the formal logical properties of the logical relations between the terms (*relata*) of propositions (*relations*) as defined by the syntactic structure of the propositions, the axioms of the systems, and the inference rules holding for the connectives (*relations*) of the system. Using a textbook example, whereas it is both syntactically valid and semantically true that “If all Greeks are men, and all men are mortal, then all Greeks are mortal”, it is syntactically valid and semantically false (or meaningless) that “If all boojams are snarks and all snarks are burdips, then all boojams are burdips”. As further expressed by Peirce (CP 6.351), therefore, “. . . I wish my description of what is true or false, to apply to what is not only true or false generally, but also to what is true or false under conditions

already assumed. Whatever may be the limitations previously imposed, that to which the truth or falsity is limited may be called the *universe of discourse*. For example, at the mention of a certain name, every person initiated into the Eleusinian mysteries invariably experiences a feeling of awe. This is true. It is therefore true that every person initiated into the Eleusinian mysteries always experiences a sentiment of awe; not universally, but only under the limitations already understood before this is said”.

The formalism that rests upon the syntactical or structural relation between terms of propositions and between propositions in determining the validity or truth of arguments or proofs, in Peirce’s terminology, the formal conditions of truth, coupled with the extra-syntactic dependence upon the semantic interpretation of propositions, rooted in the universe of discourse, in the case of Boole and Peirce these being defined by classes, is one of the principal conditions or characteristics of modern formal logic. Historiography initially attributed the unification of the semantic and syntactic streams of logic to the work in the first instance of Leopold Löwenheim (1878–1957) and Thoralf Skolem (1887–1963), and in the second instance to Jacques Herbrand (1908–1931), who applied the definitions of the universal and existential quantifiers, taken from Peirce as presented in the *Vorlesungen über die Algebra der Logik* of Ernst Schröder (1841–1902), treating logic as a calculus, in terms of logical sums and products, and applied it to the concept of logic as language, dealing with a universal universe of discourse, Frege’s *Universum*, and applying David Hilbert’s (1862–1943) concept of proof as formal to Bertrand Russell’s (1872–1970) conception, as found in the *Principia Mathematica*, of logic as language in which the universal universe of discourse is the sum total of all classes of classes. The contrast between logic on the one hand as a *mere* calculus, exemplified by the algebraic logicians, Boole, De Morgan, Peirce, and Schröder, and on the other as a language, exemplified by Frege and Russell, was first enunciated by Jean van Heijenoort (1912–1986) (1967). It is clear, however, that Peirce had already taken into consideration both aspects of logic, but did not develop it methodically or systematically.

The argument that it was Frege’s *Begriffsschrift* that inaugurated the era of modern mathematical logic as a *lingua universalis* or *lingua characterica*, rather than a mere *calculus ratiocinator*, and that the logic of Boole, De Morgan, Peirce, and Schröder satisfied the condition of being a calculus, but not a language, was formulated by Frege himself, who designated his *Begriffsschrift* a *Formelsprache* (Frege: X–XI; Frege 1896: 371). In defense of this claim, Frege and his modern adherents point to Frege’s *Universum* as a fixed and universal universe of discourse, outside of which universe there is nothing. This universality enables one to formulate propositions within the logical system about anything whatever. That Frege chose to replace the subject-predicate syntax that held since

Aristotle with the function-argument syntax is a subsidiary, if still essential, issue in the claim that the *Begriffsschrift* is both a calculus and a language. Van Heijenoort (1987) and others argue that the universality of Frege's *Begriffsschrift* and of Whitehead and Russell's *Principia Mathematica* rule out the possibility of asking about the properties (such as completeness and consistency) of their logical systems, because there is nothing extra-systematic. The corollary claim is that the reintroduction, by Löwenheim, Skolem, and Herbrand, of the calculus aspect of the algebraic logic of Boole, De Morgan, Peirce, and Schröder, and thus the simultaneous reintroduction of their model-theoretic approach through universes of discourse, enabled logicians thereafter, and in the wake in 1931 of Kurt Gödel's (1906–1978) incompleteness theorems for *Principia*-like systems, to begin to ask about the properties of logical systems, and thereby establish first-order predicate logic as the exemplar of modern mathematical logic (q.v. van Heijenoort 1967; Badesa 2004; Brady 2000).

Peirce's conception of logic as semiotic, however. Encompassing semantic and syntactic aspects, and in which one is free to operate either with a specific universe of discourse or with the universe that includes both the actual and the possible, presents his algebra of relatives as both a calculus and as a language, and one in which, as calculus, the focus is upon the formal truth (or, strictly speaking, the validity) of formulas, and, as language, the focus is upon the positive truth of propositions. This is the case underlying Schröder's argument of 1898 that Peirce's system, but not that of Giuseppe Peano (1858–1932), provides a pasigraphy, or formal language; Schroder denies Peano's claim in 1894 to having attained Leibniz's aim of providing a pasigraphic language, and compares Peirce's logic of relatives with Peano's logical system, to the detriment of Peano; but even so admitted that there was still much work to be done, and recognizes Peirce's logic of relatives as a *calculus ratiocinator*, which is capable of serving as the formal basis of a *lingua characteristic* or scriptura universalis. But Schröder doubts that such a *lingua* could be constructed, even in principle. Meanwhile, he dismissed Frege's *Begriffsschrift* as having been surpassed while failing to take account of the work already done. But Schröder did not take into account the semantic aspects of Peirce's conception of logic as semiotic.

The connection between the semantic and the syntactic is established in the case of both Peirce and Frege within the context of the universe, or universe of discourse. For both Peirce and Frege, the Universe, whatever its ontological (or existential) cardinality, is ultimately resolved into two objects. For Peirce in "Truth and Falsity and Error", following Boole in *The Mathematical Analysis of Logic*, the universe of discourse resolves into two classes, X and not- X ; "Truth is a character which attaches to an abstract proposition . . ." (CP 5.567); moreover, "Truth and falsity are characters confined to propositions . . . To say that a

proposition is true is to say that every interpretation of it is true”, and to be false entails that there is at least one interpretation for which the character asserted by the proposition fails (CP 5.567); this is the basis upon which a proposition must either be true or false. For Frege, the *Universum*, which is fixed and includes every [logical] object (*Gegenstand*) reduces to two objects, *The True* (*das Wahre*) or *The False* (*das Falsche*); and every proposition is the *name* either of *The True* or *The False*, or, more formally, the meaning (*Bedeutung*) of propositions are the names of a truth-values (*Namen von Wahrheitswerthen*) (Frege 1892: 34).

Søren Brier¹

32 Pure Zero

If we are to proceed in a logical and scientific manner, we must, in order to account for the whole universe, suppose an initial condition in which the whole universe was non-existent, and therefore a state of absolute nothing. . . . We start, then, with nothing, pure zero. But this is not the nothing of negation. For not means other than, and other is merely a synonym of the ordinal numeral second. As such it implies a first; while the present pure zero is prior to every first. The nothing of negation is the nothing of death, which comes second to, or after, everything. But this pure zero is the nothing of not having been born. There is no individual thing, no compulsion outward nor inward, no law. It is the germinal nothing, in which the whole universe is involved or foreshadowed. As such, it is absolutely undefined and unlimited possibility – boundless possibility. There is no compulsion and no law. It is boundless freedom. (CP 6.215–217, 1898).²

The quotation is from a draft of “The Logic of Continuity”, 8th and last of Peirce’s Cambridge Lectures of 1898. It is published in Ketner and Putnam’s *Reasoning and the Logic of Things* (RLT), which is an edited version of the lecture series that aims to provide an accessible introduction to Peirce’s mature thought. The passage above seems to be nearly identical to what can be found on p. 258–260 in RLT.

Interpretation

Peirce saw as his primary task the development of a comprehensive metaphysical and epistemological system after Kant and Hegel. This new theory of categories was connected to a dynamic triadic web of semiotics viewed as the dynamics of objective mind (Raposa 1989). The quotation’s idea of nothingness behind and before Firstness reveals a deep foundational issue in Peirce’s metaphysics. In CP 6.490 he uses the Old Testament concept of *Tohu Bohu* which I think is crucial to understanding the kind of philosophical system that his transdisciplinary semiotics developed into. The idea of placing ones ontology, not on matter, or energy or information but on emptiness is also close to the foundation that

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² The quote is “From “The Logic of Events”, 1898, the last of a proposed set of eight lectures. See 212n. Cf. also ch. 7, which appears to be an alternative draft. The listing in the Robin Catalogue is: 940. Logic of Events (LE) A. MS., G-1898-1: 1–11. Published in two places with minor deletions: 6.1–5; 6.214–221. Thanks to Gary Furhman for providing this information.

George Spencer Brown³ (1979) explores in his book *Laws of form* and especially in the footnotes of *Only Two Can Play This Game* (Spencer Brown 1974). This nothing is cosmological, as it is the origin of the universe and all manifest laws of any kind (physics) rests upon it, as all knowing rests precisely on this particular unknown. It is interesting that this view of emptiness as the source of everything also coincides with Feynman's development of quantum electrodynamics, which is a field ontology – or a synechism as Peirce calls it. It is a plenum view like the Greek philosopher Parmenides had, that Aristotle developed a less absolutist version of, and which inspired Peirce's *hylozoist* ontology. Peirce made his theory's relation to Parmenides question quite clear: "There is a famous saying of Parmenides . . . 'being is, and not-being is nothing.' This sounds plausible, yet synechism flatly denies it, declaring that being is a matter of more or less, so as to merge insensibly into nothing" (CP 7.569). Thus Peirce's synechism is related to the great emptiness. Peirce writes that the three worlds – Firstness (qualia and potentialities), Secondness (resistance, will, and brute force), and Thirdness (mediation and habit-taking) – must evolve from this no-thing in an evolutionary metaphysics. Brent (1998) interprets how this is consistent with Peirce's semiotic realism in the following way: "for Peirce, semiotics should be understood . . . as the working out of how the real is both immanent and transcendent and how the infinite speaker may be said to practice semiosis . . . in the creation of our universe" (Brent 1998: 212).

Inspired by Schelling's objective idealism and *Die Naturphilosophie* Peirce invents tychism and, in *The Law of Mind* (CP 6.102), an evolutionary process view of nature to explain the reality of laws as emerging through evolution. With Schelling, Peirce shares the idea of the divine process of self-realization from will to reason (Zöllner 2000), the understanding of nature as a continuum evolving from an unruly potentiality toward the divine as an expression of reasoned lawfulness of absolute mind. This synechistic determinism is mitigated by what Peirce calls *tychism*, the spontaneity and chance from which nature emerges. Tychistic chance implicates the power of possibility, contingency, and boundless freedom as an originating nothingness that is fundamental to the initial state of Peirce's cosmology, as we can see in this quotation. As Peirce writes, then this primordial, originating nothingness is the nothingness that results from freedom and potentiality continually annulling itself through variety and spontaneity in a non-foundational, transcendental ground to the divine. Peirce's idea of a pure zero in his cosmogony is close to the distinction made in Spinoza's system, between *natura naturans* (dynamic) and *natura naturata*

³ A philosophy closely connected to Niklas Luhmann's cybernetic and autopoietic inspired systems theory.

(passive). As such, a simple pantheist equivalence of God with nature becomes unsatisfactory for characterizing Peirce's vision of the divine life. Like Niemoczynski (2011) and Corrington (1994), I will emphasize the panentheistic vision of God.⁴ The mediation between the passive and the dynamic spontaneous basis for the cosmic is resolved by Peirce through mediation by Thirdness, which is the tendency to take habits, but also – as Ejsing (2007) points out – the general feature or quality of meaningful experience.

Peirce touches on the necessity of a transcendental super order behind the evolutionary processes of the three basic categories. Niemoczynski's (2011) study shows that Schelling, like Peirce, also had an evolutionary idealism and a developmental model of nature governed by a triadic model of the categories of nature's being. Schelling also argued that the first mode of possibility was a basis or transcendental *ground* necessary for the cosmos to grow and evolve.

Niemoczynski (2011) points to a second common theme found in the philosophy of Peirce and Schelling: the need for a new classification of knowledge in order to give rise to a theoretically-sound basis for studying and understanding the cosmos based on a new and broader (transdisciplinary) understanding of science that allows man to better understand the unfolding of life. Peirce's pragmatism and its special integration of mathematics, phenomenology, empirical science, and semiotics had to be based on a new and broader metaphysics, as the opening quotation indicates.

Peirce contrasted materialism (all that exist is matter) and idealism (all that exists is ideas), with his own monistic synechism, emphasizing "the tendency to regard everything as continuous" (CP 7.565). This places Peirce in a worldview beyond materialism and idealism, into a non-dualism combined with a triadic, evolutionary pragmatism that Peirce calls *pragmatism*. It is a sort of monism, but instead of having to choose between matter and spirit – where Hegel, chose spirit – Peirce sides with Buddhists and quantum physicists⁵ – and chooses a synechistic plenum.

4 This view of the divine that Peirce promotes is inspired by Schelling and the European Romantic Movement (Ejsing 2007) as well as Spinoza and Hegel. Karl Krause (1781–1832) actually in 1828 labeled Schelling's and Hegel's position as panentheism to emphasize its difference from some interpretation of Spinoza's identification of God with the world.

5 It is parallel to the Copenhagen model of quantum mechanics, where reality is seen neither as a wave nor as a particle, until the moment the token is materialized through the measurement, is interesting. In Schrödinger's later developed probability wave model of quantum mechanics, reality exists as potentials until the quantum wave collapses through the measurement process into a specific physical reality.

[Peirce] required a property characterizing unactualized possibilities which would be itself actual so that it could be observed. Yet incredibly enough Peirce found such a property in 1896 in continuity. For by his definition of the continuum ... any true continuum must contain potentialities which are not only not now actualized but which are greater in multitude than any set of events which can ever be actualized. (Murphey 1993: 395).

This non-dualism is also the foundation for his phaneroscopic point of departure, where Peirce viewed his semiotics as an expansion of the limited formal view of logic developed in the West. Logic is semiotics he says in several places (e.g. CP 2.227–231). And, “I extend logic to embrace all the necessary principles of semeiotic, and I recognize a logic of icons, and a logic of indices, as well as a logic of symbols” (CP 4.9). Peirce’s view of the continuum offered the possibility for continuity throughout matter and mind, living and dead, dissolving these supposed dichotomies. Thus he offered not only an alternative view of the mathematical continuum, but a different view of the One, which provides a possibility of finally advancing past Parmenides – as Robertson (2000) also argues.

This philosophy places *emptiness* and *the void* at the center of Peirce’s metaphysics, as it is in Buddhism. See, for instance, the version represented in the writings of Nargajuna (1995) in his famous verse: “Whatever is dependently co-arising. That is explained to be emptiness. That, being a dependent designation, is itself the middle way” (Garfield 1995: 93).⁶ This verse defines *the middle way* of Buddhism. It is the view arising from the contention that everything is supported and connected by a positive emptiness (in the form of a primary being). This is the foundation for nearly all major Buddhist schools in East Asia (Garfield 1995). The metaphysics of emptiness is to be found not only in Buddhism but also in the Vedic thinking of Shankara’s *Aidvaita Vedanta* (Isayeva 1993) and Christian mysticism (John of the Cross, 2003). The Aidvaita Vedantic approach was as well an inspiration for the European philosopher Arthur Schopenhauer’s main philosophy of the world as will. But Peirce, in his development of the concept of self as a symbol, saw a connection to his synechism, which can be seen from the following quotation:

There is still another direction in which the barbaric conception of personal identity must be broadened. A Brahmanical hymn begins as follows: “I am that pure and infinite Self, who am bliss, eternal, manifest, all-pervading, and who am the substrate of all that owns name and form”. This expresses more than humiliation, – the utter swallowing up of the poor individual self in the Spirit of prayer. All communication from mind to mind is through continuity of being. A man is capable of having assigned to him a *rôle* in the drama of creation, and so far as he loses himself in that *rôle*, – no matter how humble it may be, – so far he identifies himself with its Author. (CP 7.572).

⁶ See also Floyd Merrell’s work on these aspects in Merrell (2009).

Thus it is not surprising that Peirce sees a deep connection between Christianity and Buddhism. He sees Buddhism and Christianity melting together within a transcendental religious view of empathy and love as the foundation of human reality. In a letter to William James he writes:

I can't help thinking that the mother of Christianity, Buddhism, is superior to our own religion. That is what one of my selves, my intellectual self says. But enough, I will keep my religion to myself and to One that does not scoff at it. (NEM III/2: 872).

C. S. Peirce and William James were both influenced by Buddhist and Vedic thinking. James also met with Vivekananda as well as with Daisetz Teitaro Suzuki, the most famous interpreter of Zen Buddhism. Suzuki worked in the US for Paul Carus, with whom Peirce corresponded. He was the editor of *The Monist* in which Peirce published some of his most important articles. Suzuki (2002) is famous for his book on Christian and Buddhist mysticism where he compares Meister Eckhart's mysticism with Buddhism and finds great similarity. Actually, Peirce thought that Buddhism was in some ways more profound than Christianity and embodied true inspiration (see Brent 1998: 261 & 314). Peirce even suggested a general Buddhisto-Christian idea of religion.

[T]he supreme commandment of the Buddhisto-Christian religion is, to generalize, to complete the whole system even until continuity results and the distinct individuals weld together. Thus it is, that while reasoning and the science of reasoning strenuously proclaim the subordination of reasoning to sentiment, the very supreme commandment of sentiment is that man should generalize, or what the logic of relatives shows to be the same thing, should become welded into the universal continuum, which is what true reasoning consists in. (CP 1.673).

This term was later to be taken up by Charles Hartshorne (1897–2000), who is considered to be one of the most important philosophers of religion and metaphysics of the twentieth century. Hartshorne was also a process philosopher like Peirce. Hartshorne's work combined the philosophies of Peirce and Norbert Whitehead (1861–1947) (Hartshorne (1984). Like Whitehead Hartshorne (1972) saw God as *a supreme becoming* (Dombrowski, 2013). Hartshorne, who like Peirce had a background in Unitarianism, developed a process panentheistic theological thinking. For Hartshorne *Buddhisto-Christian* referred to a blending of Buddhist teachings about dependent origination and the unreality of a permanent self with the central Jewish-Christian commandments to love God and others. His argument was that the most inclusive love is love of God, for “only God encompasses all ‘others’”.⁷

⁷ Dictionary of Unitarian & Universalist Biography <http://www25.uua.org/uuhs/duub/articles/charleshartshorne.html>

As a unity, this divine unity is the transcendental – immanence; the one unchanging spiritual ground of all created things. This is the view, which pragmatism leads to. In Peirce's late writings one can pick out the following passage to support this view:

Pragmatism, then, is a theory of logical analysis, or true definition; and its merits are greatest in its application to the highest metaphysical conceptions. . . . A full exposition of the pragmatic definition of *Ens necessarium* would require many pages; . . . That perfect cosmology must therefore show that the whole history of the three universes, as it has been and is to be, would follow from a premiss which would not suppose them to exist at all. Moreover, such premiss must in actual fact be true. But that premiss must represent a state of things in which the three universes were completely nil. Consequently, whether in time or not, the three universes must actually be absolutely necessary results of a state of utter nothingness. (CP 6.490).

Peirce sees the world as divided into two aspects: the invisible, unified, unmanifest, implicit, synechist level of reality (the void) and the potential visible, manifold, manifest, explicit, creative process of reality (Firstness):

I may mention that my chief avocation in the last ten years has been to develop my cosmology. This theory is that the evolution of the world is hyperbolic, that is, proceeds from one state of things in the infinite past, to a different state of things in the infinite future. The state of things in the infinite past is a chaotic emptiness, tohu bohu, the nothingness of which consists in the total absence of regularity. . . . I believe the law of habit to be purely psychical. But then I suppose matter is merely mind deadened by the development of habit. While every physical process can be reversed without violation of the law of mechanics, the law of habit forbids such reversal. (CP 8.317–318).

Like the Buddhists, Peirce sees this order as no-thing. Niemoczynsk (2011) shows that both Eckhart and Böhme posited a pre-personal ground within God's own being, where this ground was called "the godhead" or "the abyss". It contains infinite potential, the absolute freedom to be, and even the will or desire to be.

Paul Forster¹

33 Peirce on Theory and Practice

The Greeks expected philosophy to affect life ... Plato tells us in many places how inextricably he considers the study of Dialectic to be bound up with virtuous living. Aristotle, on the other hand, set this matter right ... That he was not altogether a Greek minded man is manifest ... [He] was a thorough-paced scientific man such as we see nowadays, except for this, that he ranged over all knowledge ... I stand before you an Aristotelian and a scientific man, condemning with the whole strength of conviction the Hellenic tendency to mingle Philosophy and Practice ... [I]n Philosophy, touching as it does upon matters which are, and ought to be, sacred to us, the investigator who does not stand aloof from all intent to make practical applications, will not only obstruct the advance of the pure science, but what is infinitely worse, he will endanger his own moral integrity and that of his readers. (RLT: 106–7, 1898).

Everyone knows that pragmatists reject the dichotomy between theory and practice. How striking, then, to find Charles Peirce – the founder of pragmatism – inveighing against the view that philosophy is “bound up with virtuous living” and insisting philosophers disregard any potential for practical applications in their work. Though he considers philosophical questions “sacred” and takes his contributions to the field to be “of measurable importance to mankind” (RLT: 16), in this passage Peirce insists that philosophers mingle theory (i.e. “pure science”) and practice at their peril. What is to be made of this?

The quotation comes from the first of eight lectures Peirce gave in Cambridge in February and March, 1898, under the title “Reasoning and the Logic of Things”. The lecture series was arranged by William James who, upon learning that Peirce intended to discuss questions in mathematics and logic, enjoined him to change tack lest he draw only a few people. Urging Peirce to “be a good boy” and popularize his lectures, James suggested that it would be better to discuss “[s]eparate topics of a vitally important character” and “keep the lectures as unmathematical as in you lies” (RLT: 25). Though begrudging about it, Peirce felt obliged at least to try to meet James’ demands. Annoyance at having to pander to his audience and set aside lectures he had already prepared, combined with frustration at his inability to convey his ideas apart from the technical considerations on which they rest, no doubt contributed to the defiant tone of this passage. Still, it is wrong to suppose that Peirce presses the distinction between philosophy and practice merely to admonish those in attendance for immersing themselves in human affairs to the neglect of technical philosophy (RLT: 109). The view of philos-

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ophy and practice he presses has roots in his theory of inquiry, a theory that lies at the heart of his life's work.

Philosophy, for Peirce, is a branch of science. Science, meanwhile, is a practice – a communal enterprise dedicated to the attainment of shared ends – not an established body of doctrine (CP 7.52). What sets science apart from other practices is that its “single animating purpose is to find out the real truth” (CP 7.54). Scientific inquirers “cast their whole being into the service of science” (CP 7.51). They “devot[e] the sum of their energies to refuting their present errors, doing away with their present ignorance” (CP 7.50) in the “hop[e] that by conscientiously pursuing the methods of science [they] may erect a foundation upon which [their] successors may climb higher” (CP 8.136).

Peirce maintains that scientific inquiry demands an attitude very different from that shared by philosophers who dominated the field in the 19th century (RLT: 107). Having, in most cases, been trained in seminaries, these philosophers are “inflamed with a desire to amend the lives of themselves and others” (RLT: 107). Though “no doubt more important than the love of science, for men in average situations”, this “spirit” is extraneous to the pursuit of truth and those moved by it are unfit for scientific inquiry (RLT: 107–8).

Those who engage in inquiry with an eye to uncovering socially useful results are, for Peirce, no better suited to the pursuit of truth than seminarians are. To suppose “the sole reason for scientific research is the good of society” is to encourage the misconception that inquirers “who deal with the applications of knowledge, are the true men of science, and that the theoreticians are little better than idlers” (CP 8.142). Against this suggestion, Peirce insists that “[t]he point of view of utility is always a narrow point of view” (RLT: 113). He thinks chemistry, for example, would be further advanced if “the most practically important bodies had not received excessive attention” and much less advanced “if the rare elements and the compounds which only exist at low temperatures had received only the *share* of attention to which their *utility* entitled them” (RLT: 113). Inquirers interested in truth only insofar as it is serviceable “obstruct the advance of the pure science” (RLT: 107). The scientific inquirer – the one for whom “truth is truth, whether it is opposed to the interests of society to admit it or not” (CP 8.143) – “completely loses sight of the utility of what he is about. It never enters his mind” (RLT: 107).

Peirce is not opposed to applying knowledge to problems associated with living a more comfortable, interesting or virtuous life (though he thinks “for the present [the philosophy of religion and ethics are] far too dubious to warrant risking any human life upon [them]” [RLT: 108]). What he is concerned to refute is the suggestion that science aims at, or is valuable only insofar as it issues in, useful applications or superior lives. For the scientific inquirer, it is the prospect of attaining truth, not of living better, that makes inquiry worth pursuing –

indeed “makes life worth living and . . . the human race worth perpetuation” (CP 8.136). Inquirers concerned about well-being lack the “singleness of heart” (CP 7.51) necessary for scientific inquiry. “[T]he two masters, *theory* and *practice*, you cannot serve. That perfect balance of attention which is requisite for observing the system of things is utterly lost if human desires intervene, and all the more so the higher and holier those desires may be” (RLT: 113–4). Accordingly, Peirce stands against Plato and with Aristotle, for whom “theoretical science was . . . one thing, animated by one spirit and having knowledge of theory as its ultimate end and aim. Aesthetic studies were of a radically different kind; while Morals, and all that relates to the conduct of life, formed a *third* department of intellectual activity, radically foreign in nature and idea, from both the other two” (RLT: 107).

In distinguishing theoretical and practical endeavours, Peirce is not merely expressing a philosophical preference and dissenting from prevalent attitudes. The roots of his distinction lie in the account of rational belief implied by his theory of inquiry. On his view, proper inquiry has a familiar pattern. Prompted by unanticipated events, inquirers devise (by abduction) hypotheses to account for the anomalous occurrences. They then explicate these hypotheses by deducing their testable consequences. Finally, they test their hypotheses and determine whether they are warranted by principles of induction. On this theory, inquirers are not required to rid themselves of moral, spiritual and practical interests. However, they are required at every stage to subordinate such interests to the dictates of principles for making sound inferences based on firm evidence.

Peirce maintains that properly scientific inquiry is motivated by a desire to learn, a desire that implies dissatisfaction “with what you already incline to think” (CP 1.135). However, this dissatisfaction has nothing to do with spiritual discomfort or concern for well-being – one’s own or that of one’s culture or species. The dissatisfaction that incites scientific inquiry arises from a discrepancy between what actually occurs and what one expects to occur – a discrepancy that reveals one’s beliefs to be at odds with the order of things. Scientific inquiry aims to resolve such discrepancies by uncovering the truth.

When devising and evaluating hypotheses purporting to account for the puzzling phenomena that initiate inquiry, Peirce says inquirers should only consider what best advances the pursuit of truth. A hypothesis is worth entertaining, he thinks, so long as it renders unanticipated events predictable. In choosing among rival empirically adequate hypotheses Peirce thinks inquirers should be guided by principles of economy but, for him, these principles deal with epistemological payoffs, not personal or social ones. They are principles for getting the most information with the least expenditure of resources (W4: 72–9), not for maximizing the welfare of an individual or group.

Having chosen a hypothesis, Peirce thinks inquirers ought to deduce its testable consequences in accordance with his pragmatic maxim. According to this maxim, a hypothesis is explicated by its conceivable practical effects, effects specifiable by conditionals of the form “If an act of type *A* were performed under conditions of type *C*, a result of type *R* would occur in $p\%$ of cases” (W3: 265–6). On this view, the cognitive content of a hypothesis is limited to the experimental outcomes it implies. Whether belief in the hypothesis would enrich people’s lives or otherwise prove useful to them has no bearing on its cognitive meaning.

Finally, Peirce claims inquirers ought to assess the truth or falsehood of a hypothesis by conducting experiments to determine whether an event of type *R* actually results in $p\%$ of the cases in which an action of type *A* is performed under conditions of type *C*, as the hypothesis states. In any given trial, whether an event of type *R* occurs or not is a matter for “perceptual judgment” (CP 5.157). In rendering such judgments inquirers interpret experience, rather than passively apprehend present sensory contents (CP 7.623). However, they affirm these judgments because they are compelled to by the brute force of experience, a force that operates independently of their wishes or desires (RLT: 170). In evaluating hypotheses by induction on perceptual judgements “[science] simply surrenders itself to the force of facts” (RLT: 176). The results of inquiry, in the end, are justified and “caused by nothing human, but by some external permanency – by something upon which our thinking has no effect” (W3: 253). Moreover, these results are true or false solely in virtue of the order of events. Since the moral or practical consequences of beliefs are incidental to their justification and truth (except, for hypotheses explicitly about such consequences), Peirce views the pursuit of truth as distinct from the pursuit of edifying or useful beliefs.

On Peirce’s account, true beliefs imply the reliability of certain habits of action (habits of the form “If act *A* were performed under conditions *C*, result *R* would occur in $p\%$ of cases”) and possession of such habits enables inquirers to engineer events to suit their purposes. However, it does not follow from this that the search for truth reduces to the search for useful beliefs.

For one thing, Peirce’s account applies equally to beliefs that have fruitful applications (e.g. Newton’s first law) and beliefs that do not (e.g. that “dreamt” is the only English word ending in “mt”). The truth of both sorts of claim is determined by the reliability of certain habits. However, their usefulness depends on whether these habits provide a means of attaining ends other than truth. Since scientific inquiry seeks truth without regard for the uses to which it might be put, it remains distinct from the search for useful beliefs, even where these two searches coincide.

Secondly, Peirce thinks that the interest in attaining truth transcends the limited interests of individuals or finite groups. This is because inquiry, as he

understands it, is fallible. For him, the method of inquiry is self-correcting – any falsehoods inquirers come to accept in pursuing it are capable of being overturned through further inquiry. In light of this, he thinks inquirers can rest assured that in following the principles of inquiry they are on the path to truth. What they cannot be sure of is whether truth has or will be discovered in their lifetime (or ever). Peirce grants that it is idle to doubt a theory that has proven reliable in a large number of trials and inquirers are right to treat such theories as established and even use them in further inquiry (RLT: 176). However, he also holds that every truth claim implies an inexhaustible totality of experimental consequences and that available evidence for a hypothesis is never more than finite. The principles of inquiry do not allow inquirers to determine whether the available evidence for a hypothesis comprises a sufficiently large and reliable sample of the evidence that bears on its truth. There is no precluding the possibility that even a well-established theory will require revision in light of future evidence. While inquirers may reasonably take the revision of a hypothesis to be extremely unlikely given overwhelming evidence in its favour, this is far different from being able to determine precisely what the odds against future correction are. The only way to ascertain whether a well-confirmed hypothesis is really true is to engage in further inquiry and see what evidence turns up. Inquirers seeking truth, not merely warranted opinion, accept current theory provisionally, pending further investigation (RLT: 178).

On Peirce's view, then, scientific inquirers seek truth in the absence of any assurance that their search will be successful and their diligence rewarded. They put "[their] shoulders to the wheel for an end that none of [them] can catch more than a glimpse at" (CP 5.402n) and do so "not so much for themselves as for future generations" (CP 7.50) – future generations of inquirers who devote themselves to advancing inquiry for still later generations of inquirers. Peirce thinks "[n]o man can be logical [i.e. conform to the principles of inquiry] who reckons his personal well-being as a matter of overwhelming moment" (RLT: 10). Inquirers "must prefer the truth to [their] own interest and well-being . . . if [they are] to do much in science" (CP 1.576). "[L]ogicality inexorably requires that our interests shall *not* be limited. They must not stop at our own fate, but must embrace the whole community [of inquirers]. This community, again, must not be limited. . . . It must reach, however, vaguely . . . beyond all bounds" (W3: 284). Theoretical concerns – concerns for the fortunes of the indefinite community of inquirers – are utterly distinct from practical concerns – concerns for oneself or for some limited group.

Not long after delivering his Cambridge lectures, Peirce revised his view of the connection between philosophy and ethics (CP 5.129). He came to appreciate more fully than before that, on his view, inquiry is a special case of self-

controlled conduct, conduct deliberately undertaken in light of an ideal (CP 1.573). In light of this realization, he concluded that the normative science of logic – the theory of inquiry – draws principles from two higher order normative sciences: ethics and aesthetics. The first studies the general conditions of realizing ideals (CP 5.594), the second studies what is admirable unconditionally (CP 5.36).

This new view might seem to undermine Peirce's claim in 1898 that theoretical philosophy has nothing to do with virtuous living. If, as he came to think, the theory of inquiry rests on principles of ethics and aesthetics, then philosophical theorizing about the pursuit of truth seems inexorably linked to questions of how to conduct our lives and to what ends. Thus, it might be thought, Peirce's change of heart about the connection between ethics, aesthetics and philosophy implies a change of heart about his distinction between theoretical and practical pursuits.

Such a conclusion is hasty, however. On his later view, science is still distinguished from other forms of practice by its singular devotion to the attainment of truth guided by proper principles of inquiry. Moreover, within the domain of science, Peirce distinguishes two separate branches – the theoretical “whose purpose is simply and solely knowledge of God's truth” and the practical which is “for the uses of life” (CP 1.239) – and insists that it is a great error to suppose that all sciences are directed to practical ends (CP 1.243 n1).

When classifying the normative sciences, Peirce insists that ethics and aesthetics are “purely theoretical” (CP 2.156). Unlike practical sciences – such as pedagogy or navigation (CP 1.243) – the normative sciences do not enhance skills (CP 5.125). They aim at the discovery of truths, rather than improving proficiency in the art of living (CP 1.281). As he conceives it, the normative science of ethics does not determine how human beings ought to act in this or that circumstance. It aims rather to define what the rightness of conduct (human or otherwise) consists in (CP 1.575–77). Similarly, the normative science of aesthetics does not uncover what is intrinsically valuable to human beings (CP 5.128), but rather what is admirable “*per se* in itself regardless of what it may lead to and regardless of its bearings upon human conduct” (CP 5.36).

Finally, while Peirce grants that the normative sciences have important consequences for living (CP 5.125), he maintains that they rest on mathematics and phenomenology, both of which are prior to any knowledge of the nature of human beings or the conditions in which they live. To apply principles of normative science to the question of how human beings ought to conduct themselves is a matter for the practical sciences and these sciences, he insists, are not an “integrant” part of normative science (CP 5.125). Thus, whatever implications for living the normative sciences may have, they do not constitute either the basis or the subject-matter of ethics and aesthetics as Peirce defines them.

For Peirce, then, scientific rationality demands that the interests of the community of inquirers be put ahead of the interests of individuals or limited groups. It also requires that spiritual, moral and material interests be subordinated to the attainment of truth. Although Peirce considers scientific inquiry to be a special case of rational conduct, he insists, nevertheless that there is a fundamental distinction between conduct devoted to the pursuit of true theory and conduct devoted to the practical search for edifying or useful beliefs.

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Tomis Kapitan¹

34 Peirce and the Discipline of Metaphysics

I think we must abandon the idea that metaphysics is backward owing to any intrinsic difficulty of it. In my opinion the chief cause of its backward condition is that its leading professors have been theologians. (CP 6.2–3, 1898).

Peirce's Claims

There are three claims about metaphysics to which Peirce is committed in this passage. First, that the discipline is in a backward condition; second, that it has been dominated by theologians; third that the reason for its backward condition is due to this dominance rather than to any intrinsic difficulty of the discipline. My concern here is to determine why Peirce endorsed these claims and whether they accurately reflect the state of metaphysics both historically and in the contemporary setting.

That Peirce viewed metaphysics to be in a “deplorably backward” state is further evidenced by his statements that metaphysics has been plagued by “ceaseless and trivial disputation” (CP 6.5), and is a “puny, rickety, and scrofulous science (CP 6.6). Judging from what he said elsewhere at the same time (see EPII, 29), Peirce was probably talking about the state of the discipline in the late 19th century, though the same sentiment has been voiced by others at different times, especially by those who regard metaphysical disputes as largely verbal and metaphysical claims as devoid of determinate truth-values.² Yet, Peirce did not identify with the typical nay-sayers who locate the difficulties with metaphysics within the very nature of the discipline. He did not think that metaphysics is backward because it is an *abstract* science; logic and mathematics are also abstract, yet each is graced by admirable progress and ever-increasing sophistication. Nor is metaphysics backward because its subject matter is inaccessible to observation. The items studied by physics and astronomy – the very small and the very large and distant – are not immediately accessible either, except in an indirect sense of observing the alleged effects of their interactions with other objects. To the contrary, since the business of metaphysics is “to study the most

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² For a recent treatment of these and related issues in the contemporary setting, see the collection of papers in Chalmers [et al], 2009.

general features of reality and real objects”, then every observation yields potentially relevant data for metaphysical theorizing. Indeed, “the data of metaphysics are not less open to observation, but immeasurably more so” (CP 6.2).³

Explaining the backward state of metaphysics in terms of domination by theologians assumes that the latter *have* dominated the field. Peirce did not elaborate, but there is little doubt that in both the western and eastern traditions, a vast number of metaphysicians have been motivated by theological or, more broadly, religious concerns – today as before – and, at times, these concerns have dominated. But why should this result in a moribund state of metaphysics? Peirce’s explanation is that theologians are first and foremost *practical* men devoted to the goal of defending certain religious beliefs that they are unwilling to abandon. They differ from the true metaphysicians who, like all scientifically minded persons, are passionate about attaining truth, and are unwilling to compromise that passion by subordinating it to any other end. The latter regard their own beliefs as provisional and are willing to alter them and even have them swept away should the evidence require it.⁴ The same willingness is not there with theologically inspired metaphysicians and, for this reason, they “cannot wish to learn the truth” (CP 6.3).

But why should the stubbornness of some theologically motivated metaphysicians be anything more than their personal problem, preventing only *them* from engaging in an impartial open-minded search for truth? Why should it infect the field of metaphysics itself? It is not so much that most metaphysicians tend to be religiously inspired, but that they do not confine their resistance to altering beliefs to the personal arena. Peirce wrote:

Now the principal business of theologians is to make men feel the enormity of the slightest departure from the metaphysics they assume to be connected with the standard faith. (CP 6.3)

³ The purpose of metaphysics is “to study the most general features of reality and real objects (CP 6.2). While Peirce sometimes distinguished between different branches of metaphysics, viz., *ontology*, *psychical metaphysics*, and *physical metaphysics* (EPII, 260), he tended to equate “scientific metaphysics” with metaphysics as it should be done, namely, “with the scientific attitude, that is, from the desire to find out how things really are” (Haack 2003: 776). His view of the relevance of observation to metaphysics is in stark contrast with the views of those like E. J. Lowe (1998: 11) who writes that metaphysics is not an empirical science because (i) it does not appeal to observational data in supporting its claims, (ii) is concerned with abstract entities that do not exist in space and time, and (iii) makes claims about the merely possible.

⁴ Informative discussions of Peirce’s view of metaphysics as a science can be found in Parker 1998, De Waal 2001, Haack 2007, and Nubiola 2013.

If I understand him correctly, Peirce held that once theologians feel that they have anchored their religious beliefs in a satisfactory metaphysical framework, they view the slightest departures from that framework with suspicion. Here, then, is a real danger to metaphysics; it is not merely that theologians are not themselves genuine seekers of truth, but that they would impose a tyranny of thought by closing off reasoned exploration of alternatives. Theology begins in doubt, Peirce wrote, but its aim is to silence doubt on behalf of religion. Because of this, theologians, while partly “scientific” in wanting to provide reasons for specific claims, are also “unscientific” in willfully restricting an open-minded exploration of the issues. To this extent, they have a “deplorably corrupt” influence upon the field (CP 6.3).

Was Peirce Correct?

Was Peirce correct in his claims about metaphysics? Partly yes, and partly no. Let me begin with the negative. *First*, extending our scope beyond the 19th century, we find that the discipline of metaphysics is not always backward. It hardly bears mentioning that the 300-year period from the Ionians to the Stoics and Epicureans witnessed a tremendous development of metaphysical notions that still dominate much of the field. Few epochs can match that brilliance, but metaphysics has also flourished in the Islamic world from the 9th to the 12th centuries, among the medieval scholastics of the 12th–14th centuries, and among the leading European philosophers of the 17th century.

Closer to the present, judgments are more subject to taste. Although there has been hostility to metaphysics throughout much of the 20th century, there is currently a lively activity in nearly every sector of the discipline. This is partly due to the infusion of formal techniques that have allowed for a clearer recognition of theoretical alternatives. For example, an increased sophistication is noticeable in the metaphysics of modality and mind, and with it, advances in the treatments of causation, action, free will, time, composition, and persistence. A decade or more into the 21st century, we are able to formulate the issues and theoretical options more sharply than did our predecessors, and to that extent there has been progress. With the current levels of productivity and healthy exchange of ideas, the discipline of metaphysics is alive and well.

Second, despite the activity, there remains a persistent concern about metaphysics being a science perennially riddled with dispute and incapable of progress. The reasons for this are not that metaphysical theories are incapable of being precisely expressed or of offering explanations. As Peirce realized, theories in

metaphysics can be as formal and as explanatory as theories in any other discipline. The problem stems from the ambition of metaphysics to offer a systematic framework adequate for the interpretation of *everything* within our experience. As a result, it must focus on very general and pervasive patterns, and theoretical options at this level are radically underdetermined by the data. There is perennial disagreement about the fundamental modes of classification and terms to be used, generating a wild divergence not only in hypotheses but also in the very formulation of the problems to be investigated. Paradigms are difficult to establish, and even when a given metaphysical framework commands widespread allegiance, rivals in the wings constantly threaten to upset the status quo. Lack of agreement should not be confused with a lack of progress in any discipline, but there is no doubt that the radical underdetermination of theory by experiential data is a principal reason why some impatient thinkers have given up on the field.⁵

Third, metaphysics has not always been dominated by theologians. Among the ancient Greek metaphysicians, theological beliefs and defenses of “standard faith” were not among the foremost motivators. Theological concerns did dominate in the fruitful era of Islamic thought, but the leading metaphysicians, from the 9th century Al Kindi to the 12th century Ibn Rushd, worked largely outside the arena of the more orthodox *mutakallimūn*. Again, Descartes, Spinoza, and Leibniz were each men of God in their own way, but none fit Peirce’s image of the theologian eager to defend standard faith at the expense of truth. There remain plenty of theologically minded metaphysicians active since Peirce penned the cited passage, notably, Alvin Plantinga and the many he has inspired. But the majority of the “leading professors” during this time, from Bertrand Russell to David Lewis, seem not to have a theological agenda.

Fourth, the claim that theologians are responsible for the backward condition of metaphysics ignores the fact that, historically, a good number of *developments* of metaphysics – if not the *innovations* – have been driven by theological concerns. In the early days of Islamic thought, theological concerns about the consistency of God’s power with God’s justice prompted extensive theological debates that, in turn, generated intensive investigation into the nature of causation. In turn, this gave rise to the sophisticated Neoplatonism of Al-Farabi and Ibn Sina, the occasionalist critique by Al-Ghazali, and the Aristotelian mediation

⁵ Peirce pointed out that because the general patterns that metaphysics seeks to unveil so saturate our experience, we usually pay no attention to them (CP 6.2). Whitehead (1929: 4–5) said something similar. Attention requires contrast, and with pervasive patterns it may take considerable imagination to locate the relevant contrasts.

by Ibn Rushd. These developments, in turn, stimulated the rise of metaphysics in medieval Christendom, resulting in the advances in highly nuanced systems developed from the early 12th to the early 14th centuries, notably, Aquinas's. Again, thinkers like Spinoza, Leibniz, and Whitehead were, in their own way, theologically inspired, but each was a highly innovative metaphysician. In the present day, even if we disagree with the project and details of Plantinga's efforts – e.g., his possible worlds Platonism, his hostility to naturalism, or his quaint theism – it is undeniable that he and his followers have contributed significantly to the development of modal metaphysics.

Fifth, there may be a hidden benefit to metaphysics because of its connection to religious concerns. Recall Kant's remark that metaphysics would survive even if all the other sciences "were engulfed utterly in the abyss of an all-annihilating barbarism" (Kant 1787: B xiv). Why should this be so? The answer is that religion, in one form or another, is very likely a constant in human life, and some sort of metaphysics is inevitably called upon in its support. In general terms, *religion* is motivated by the desire to resolve the discomfort or unease caused by the feeling that things are not fully as they ought to be, at least not in one's natural state. To an extent, the unease is as much a metaphysical ailment as it is psychological, because the sentiment that there is a lack of fit between our desires and the world concerns a very abstract pattern permeating our encounter with reality. Religion has its genesis in the attempt to resolve this discomfort through the discovery, articulation, and establishment of a particular *religious vision* (Kapitan 2009). To survive, this vision must be supplemented with a set of theoretical claims about the world and the human condition, and with various norms for securing a positive transformation(s) wherein religious unease may be reduced or eliminated. Understood in this way, *a* religion is an institutionalized effort to articulate and implement a particular religious vision.

Theology attempts to provide a metaphysical basis for theistic religious visions and, as such, it is one species of the more general endeavor to provide metaphysical bases for religious visions. The intended result of any effort within this endeavor is to place a particular vision on a more secure intellectual basis. Yet, religion is not the only persistent factor in our emotional lives; our rationality is also a constant. Inquisitive people will invariably confront questions about the intelligibility of a given religious vision, and they will demand a response. Those sensitive to the demand will be stimulated to provide the response, and so metaphysical theorizing will continue, if only in a *handmaiden* role. At times, this may be the best hope for the survival of metaphysics. But those whose passion is to attain truth may still be somewhat thankful, for one beneficial off-

shoot is that the activities of questioning, theorizing, and testing that typify the practice of science will endure.

Securing a Healthy State of Metaphysics

I have argued that the discipline of metaphysics is not necessarily backward, that theologically inspired metaphysicians have contributed to its development, and that the apparent lack of progress in metaphysics is partly due to an inherent difficulty that confronts the field. As such, I am countering each of the claims embedded in the cited passage from Peirce. But now I want to address one insightful element in what he said.

Peirce wanted metaphysics to be scientific, dominated by people whose passion is to find truth, and for this reason he correctly sensed the dangers posed by the theologically minded. When metaphysics is exploited to supplement a given religious vision, then, although this motivation is not misguided or devious in its own right, it generates the twin threats of (i) sacrificing the ideals of science while trying to satisfy a religious quest, and (ii) imposing a tyranny of thought. The question that arises is this: in light of these threats, what can be done to ensure a healthy state of metaphysics? If what I have said about religion is correct, there is no hope of preventing the religiously minded from pursuing metaphysics. At best, what can be done is to ensure that they do not dominate the field in a way that is inimical to progress. How can this best be achieved?

Three principal steps can be taken. The first is to develop a consensus about what the discipline of metaphysics is supposed to achieve. To my mind, what distinguishes metaphysics is that it is the most *comprehensive* study of reality, an effort to develop a framework of *general* concepts adequate for a description, an interpretation, and an explanation of every aspect of reality; at least of reality as we experience it. As such, while it aims at articulating those fundamental features, patterns, and contrasts permeating our experience, it gathers its data from every sector, including what is provided by the special sciences.

The second step is to insist that metaphysicians adhere to the aims and methods that have come to be a trademark of science. The criteria for judging a metaphysical scheme are the usual ones for judging any scientific theory: consistency, coherence, and explanatory power. Given the goal of metaphysics – to formulate a system of ideas suitable for the interpretation of *all* reality, or of *all* experience – then the demand of adequacy is nothing less than a demand for

absolute comprehensiveness; everything in our experience must find a place within the scheme. The ultimate test of any metaphysical theory, as with any scientific theory, is *progress*, and progress is a matter of the emergence of more coherent and more comprehensive theories.⁶

The third step is to establish and maintain legal safeguards within our political and education institutions that will ensure a clear path for the unfettered scientific quest in *all* fields, and thereby limit the institutional power of those who are inimical to the investigations in any field. One purpose of such safeguards is to prevent religiously minded metaphysics from gaining hegemony over those institutions in which metaphysical research is conducted. The liberal ideals of freedom of thought and expression, and the restrictions on the political power of clerics, are the greatest guarantors of scientific progress.

With measures such as these, we can protect and advance the prospects of a healthy scientific metaphysics that Peirce so passionately advocated.

⁶ See Whitehead 1929: Part I, Chapter 1, for an interesting discussion of the aim of metaphysics – what he called “speculative philosophy” – and the criteria for judging a metaphysical theory.

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35 Peirce's First Rule of Reason and the Process of Learning

[The] first, and in one sense [the] sole, rule of reason [is] that in order to learn you must desire to learn, and in so desiring not be satisfied with what you already incline to think . . .
(EPII 48, 1898).

The above quotation is from “The First Rule of Logic”, Peirce’s fourth lecture in the Cambridge Conferences series he delivered in the winter of 1898. Also in this lecture is the well-known corollary of Peirce’s ‘first rule of reason’ that one should not “block the way of inquiry” (CP 1.135).² The basic claim of the ‘rule of reason’ as articulated can be straightforwardly understood as follows. One engages in reasoning “to find out, from the consideration of what [one] already know[s], something else which [one does] not know” (CP 5.365). Thus, it seems obvious that reasoning must be predicated on a desire to learn, i.e. a desire to find out something not known, which is a manifestation of one’s dissatisfaction with the present state of one’s beliefs. As Susan Haack (1992) notes, Peirce’s discussion of genuine inquiry as a truth-seeking enterprise suggests that the first rule of reason is in some basic sense tautological (248). This way of understanding Peirce’s first rule of reason, however, does not do justice to the rule as a “substantive principle” (to use Haack’s phrase) in Peirce’s pragmatism. Properly understood in its pragmatic context, Peirce’s first rule of reason showcases Peircean fallibilism in connection with his theory of inquiry as well as his understanding of the crucial role of community. The first glimpses we get of such connections come in the context of the quotation itself. I begin with some biographical background relevant to Peirce’s Cambridge Conferences lecture series. Peirce’s personal and professional conditions, before and during his production of the lectures, might aid in explaining some of the issues he raises there. The full import of these issues for Peirce’s pragmatism, however, is only to be gained by considering his philosophical treatment of them and their connections with other aspects of his pragmatism.

The year before Peirce gave the Cambridge Conferences lectures his intellectual work was almost entirely devoted to logic and his theory of signs. He had, in January of 1897, invented the system of existential graphs; that same year

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² The corollary to the first rule of reason warrants its own special treatment, skillfully supplied in this volume by Lucia Santaella.

saw the publication of “The Logic of Relatives”, and some few reviews for the *Nation*; meanwhile his work continued on his unpublished book of logic and on his semiotics. The conditions of Peirce’s personal life and career prospects, however, were dismal. Joseph Brent, in his biography of Peirce, describes this period as the “nadir of [Peirce’s] life” (341). In a letter to William James, Peirce describes the previous “few years . . . [to have been] terrible beyond anything that the man of ordinary experience can possibly understand or conceive” and that his experiences had “throw[n] strong lights upon philosophy in these years” (RLT 8–9).³ James’ suggestion that Peirce might come to Cambridge to lecture, conveyed to Peirce through Paul Carus, was received with such enthusiasm that Peirce began “diligently working” to put together a course on logic and ‘begged’ of James that he inform Peirce “what the prospects are” (RLT 16). The prospects, as it turned out, were much less fortuitous than Carus had suggested. Peirce had hoped to find a position in Cambridge, perhaps to at last secure the ever-elusive academic appointment. James responded that any permanent position, even a minor one in the University Library, was out of the question, but that he was making progress in securing a lecture series for Peirce (RLT 17).

Peirce agreed to prepare eight lectures, and corresponded with James several times about his progress in the preparation as well as the content of the lectures themselves. James enjoined Peirce repeatedly to choose topics that would be of popular interest and to purge the material of mathematical and logical technicality. In one of Peirce’s responses he wrote:

Your Harvard students of philosophy find it too arduous a matter to reason exactly. Soon your engineers will find it better to leave great works unbuilt rather than go through the necessary calculations. And Harvard is only a little in advance of the rest of the country on this road, and this country a little in advance of Europe. (RLT: 26)

In a later letter he refers to Harvard as “the Corporation” (RLT: 27), insinuating its educational policy to be that of a business rather than that of an institution of learning. A veiled version of this accusation appears in the fourth lecture itself, which in his letter of 4 January 1898 he writes “is to be upon the highest maxim of logic, – which is that the only strictly indispensable requisite is that the inquirer shall want to learn the truth” (RLT: 28). We shall return to aspects of this informal characterization of the first rule of logic in the course of analyzing the rule in its more explicit formulation.

³ References to Peirce’s correspondence with William James and to the Cambridge Conference lectures are taken from Kenneth L. Ketner’s *Reasoning and the Logic of Things*, here and hereafter abbreviated RLT.

The first rule of reason Peirce does not articulate until he is well into his fourth lecture. The initial discussion develops Peirce's argument that all modes of reasoning, properly understood, are iterative and self-correcting. On the implicit assumption that inquiry just is one or more modes of reasoning, Peirce concludes: "Thus it is that inquiry of every type, fully carried out, has the vital power of self-correction and growth. This is a property so deeply saturating its inmost nature that it may truly be said that there is but one thing needful for learning the truth, and that is a hearty and active desire to learn what is true" (RLT: 170). This 'active desire' that is prerequisite for learning Peirce terms the "Will to Learn", which is characterized by supposing "a dissatisfaction with one's present state of opinion" (RLT: 171). Such dissatisfaction, according to Peirce, and consequently the will to learn, seems absent from "our American Universities", which have become "institutions for teaching" instead of "institutions for learning". Peirce claims that teaching involves imparting opinions about which the teacher is thoroughly satisfied. Indeed, he claims that teaching requires absolute confidence in the truth of that which is taught, whereas for learning to occur one "must be penetrated with a sense of the unsatisfactoriness of [one's] present condition of knowledge" (*ibid.*). Thus what began as a discussion about reasoning turns into an indictment of the state of American academia.

Peirce's indictment of American higher education carefully avoids any direct accusation of Harvard University in particular. He says that he hopes to discover, in his time in Cambridge, whether Harvard aims to prepare its students for individual success as high-earning businessmen, and is thus "an educational establishment or whether it is an institution for learning" that works to prepare its students to serve the good of the country in the service of solving its most urgent problems (172). As a sort of standard-bearer for the country, Peirce suggests, Harvard University's role in this regard might well determine the course of the nation. Even if Harvard is an educational establishment, meting out established opinions, the state of what has been established in science is obviously incomplete. Thus, in any case Harvard's students cannot fail to notice the questions that remain unanswered and the problems that remain unsolved.

In "The First Rule of Logic", Peirce reinforces a fallibilist attitude as, at least grounded in the limitations of current understandings, and at best a prerequisite assumption of reasoning also understood as inquiry. It is in his fifth lecture, "Training in Reasoning", that Peirce addresses particular steps involved in reasoning and how to cultivate one's reasoning powers. There are three "mental operations concerned in reasoning"; observation, experimentation, and habituation (RLT: 182). Each of these consists of subcategories of operations, all of which must be developed in order for one to reason as sharply and powerfully

as possible, and Peirce provides examples of how to test and hone one's reasoning skills in various of the subcategories. For present purposes, however, which concern the learning process, it is the third category – habituation – that is of greatest interest. In order to understand how habituation is related to the process of learning, we turn to a brief discussion of Peirce's theory of inquiry.

According to Peirce's theory of inquiry, beliefs are understood as habits of action (or predispositions) that come into question when they are met with some surprising or recalcitrant experience. When such experience is sufficiently unsettling as to disrupt some established habit of action, this prompts inquiry, which is an attempt to find a suitable belief that re-establishes an appropriate habit of action.⁴ Thus, on this model, to learn something new, is to initiate a new habit of action. Put more concisely: learning, for Peirce, is habit-formation. Thus, the will to learn must be understood, given Peirce's theory of inquiry, as the will to habituation. What is involved in habituation, according to Peirce, is elaborated in "Training in Reasoning".

What Peirce calls 'habituation,' in the beginning of "Training in Reasoning", he later refers to as "[t]he operation of acquiring associations" (RLT: 191). Facility in habit-forming, or learning, is a kind of 'plasticity.' Peirce writes: "Perfect readiness to assimilate new associations implies perfect readiness to drop old ones. It is the plasticity of childhood, which if a man is going to become a teacher, or an exponent of a fixed idea . . . it is just in so far best that he should outgrow. But so far as a man is to be a learner . . . it is most essential that he should preserve" (192). In order to exercise this power, or cultivate such plasticity, Peirce recommends "extensive reading", "[c]onversation with all sorts of people whom we do not altogether understand", and "a suitable dose of rumination and solitude . . . provided that it not be idling, but intense and systematic . . . thought" (ibid.). All of these deserve some consideration as modes of exercising one's power of habituation. Before we turn to such consideration, though, we should examine the inroads that have already been made toward understanding the first rule of reason and its application in cultivating learning.

In regards to applying the first rule of reason, Haack, in her "The First Rule of Reason", offers considerable insight into Peirce's systematic treatment of issues related to truth, inquiry, and how communal exchange and scrutiny mediates individual inquiries so as to advance the pursuit of truth.⁵ Insofar as inquiry is

⁴ This discussion derives from Peirce's treatment of inquiry in his "Fixation of Belief", and echoes in its outlines the account offered in Misak 1991 chapter 2.

⁵ Interested readers should consult also Migotti (1995), especially for an account of an existentialist evaluation of Rorty's work. This account relies on Peirce's rule of reason to substantiate the claim that Rortian 'inquiry' can only be inquiry in bad faith.

motivated by a desire to learn the truth, the nature of truth and the possibility of its attainment are significant factors for understanding such desire. Truth, on Peirce's view, is not something that one can knowingly attain; this is the force of fallibilism. This is not to say that truth is unattainable, only that even if truth were attained, we could not be certain of such attainment. Truth, then, functions in Peirce's system not as a goal, *per se*, but as a regulative ideal.⁶ The ideal is this: truth is what would be the final opinion held by the community of inquirers were inquiry carried as far as it could go.⁷ The true opinion is 'final' in the sense that no inquiry could turn up information that would overturn or modify the opinion. For this final opinion to constitute truth it must be such that the entire community of inquirers would accept it; this is a safeguard against the 'vagaries' of individual opinions and individual perspectives. These features of Peirce's pragmatism are accommodated by Haack in her discussion of "genuine inquiry" and the "truth-seeking attitude" by requiring that inquirers be persistent, broad, and candid (in specialized senses of these words), all of which invoke inquiry that requires communal activity and exchange, in some sense.

The discussion offered here is not at odds with Haack's, nor does it offer conclusions that contradict hers. It does, however, depart from a slightly different point of emphasis. Haack's discussion focuses primarily on what is supposed to be the (ideal) product of (completed) inquiry, truth. That is to say, Haack considers that the desire to learn is the desire for truth. Thus, her discussion is informed at least in part by what could contribute to the supposed product of ideally conducted or completed inquiry. Following Douglas Browning in understanding Peirce as a "philosopher of process", the discussion here focuses instead on the process, rather than the product, of learning.⁸ In what follows I shall try to explain, as well as motivate, this treatment.

According to Browning, the key feature of "[p]rocess philosophy . . . is that the universe is essentially to be understood as creative, organic, and temporal" (xxiii). As articulated, this is clearly a metaphysical position, although it leads also to an epistemological position (or range of positions). It is in this epistemological regard that Peirce's views about inquiry and the process of learning are to be understood. In a number of places, Peirce describes learning as a 'gain of experience.'⁹ To seek gains of experience requires, in Peircean terms 'dissatisfaction' with one's own experience. Dissatisfaction is not to be understood in terms

6 For a more detailed account, see Misak 1991 chapter 4.

7 This notion of truth has been widely discussed by Peirce scholars, both as to its epistemological status as well as its metaphysical basis. For a novel discussion of these two aspects see McLaughlin's "Pragmatic Polymorphism: Between Realism and Anti-Realism" 2009.

8 Browning, Douglas (ed.). *Philosophers of Process*. (Random House: 1965).

9 Cf. CP 1.21; CP 2.336; CP 7.345.

of the inadequacy of one's experience, though one's experience is of course on its own inadequate (for reasons discussed previously). The sort of dissatisfaction Peirce has in mind is better construed as a hunger, or thirst. The desire to learn is not to be understood as being 'in want' of the true opinion. On this view everyone is in such 'want' for no opinion can be relied upon as the true opinion. The desire to learn is the quest for experience, which on Peirce's view is itself a process and is to be construed very broadly. Thus, to focus on the desire for truth is to engage in the search for that which cannot (knowingly) be attained, and thus to doom oneself to failure. The desire to learn, however unsatisfiable, is destined for success; for success is to be measured not in what is gained, so much as in the continuation of the process of gaining. Wherever such gains are discussed, Peirce refers to them in process-oriented terms and as fundamentally transactional.¹⁰

The implications of Peirce's views for implementation in education have already been discussed in some detail in a special issue of *Studies in Philosophy and Education*. Of especial relevance to issues invoked by Peirce's first rule of reason are the papers by Douglas Anderson, and Torill Strand. In addition to their implications for pedagogy, Peirce's views are relevant to discussions of the state of public education and the business model of academic institutions. As for the development of Peirce's own views, if nothing else the Cambridge Conferences lectures provided him a venue for engaging in conversation with others whom he may not have altogether understood, and so likely reinvigorated Peirce's own 'will to learn' as it evidently had influenced William James and Josiah Royce in the paths that their own subsequent inquiries would take.¹¹

¹⁰ For example, at CP 1.44 Peirce writes that "it is not knowing, but the love of learning, that characterizes the scientific man". See also CP 1.376–378; CP 7.536.

¹¹ See RTL: 36.

Floyd Merrell¹

36 Bridging Ancient and Contemporary Knowing

Thus the discontinuity can only be produced upon that blackboard by the reaction between two continuous surfaces into which it is separated, the white surface and the black surface.

The whiteness is a Firstness—a springing up of something new. But the boundary between the black and white is neither black, nor white, nor neither, nor both. It is the pairedness of the two. It is for the white the active Secondness of the black; for the black the active Secondness of the white. (CP 6.203, 1898).

This Peirce quote in a strange way might conjure up thoughts of quantum theory and Buddhist philosophy. Not in the pop physics or the feel-good-karma way. In the Niels Bohr (1958) to John A. Wheeler (1980a, 1980b) interpretation of quantum theory and the Mahayana Buddhist or Nāgārjuna way (Balasubramanian 1992, Garfield and Priest 2003, Kalupahana 1986, Mansfield 1989). How so? In the manner in which Peirce introduces this quote with: “Let the clean blackboard be a sort of diagram of the original vague potential”. Vague potential: the imageless notion of that limitless range of quantum possibilities – or “potentialities” in Werner Heisenberg’s (1958) words. And the imageless allusion to Nāgārjuna’s “nothingness”, or better, “emptiness” (Glass 1995). Peirce tells us that the blackboard is “a continuum of two dimensions, while that which it stands for is a continuum of some indefinite multitude of dimensions”.

But of course! How else might multiple dimensions be portrayed? If not by analytically reducing a solid object to shards and synthetically rendering it visible – through multiple perceptual takes – in cubist fashion. Or if not through the image of a “rubber sheet” as visual metaphor of the four-dimensional time-space continuum, basic to accounts of relativity theory. The continuum, Peirce goes on, “is a continuum of possible dimensions of quality, or is a continuum of possible dimensions of a continuum of possible dimensions of quality, or something of that sort”. And so on, in *infinite progressus* fashion. In another manner of putting it, the cubist shards collapse into infinitesimal points an infinity of which make up a two-dimensional sheet; the rubber sheet extends out and folds over onto-into itself making up a sphere whose center is everywhere and whose circumference is nowhere. But we continue reading in CP 6.203 that there are “no points on this blackboard. There are no dimensions in that continuum”. This is to say, not yet, until some semiotic agent within the

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two-dimensional surface, a “point” herself so to speak, constructs a point which is her *other* differentiated from her-as-point. More on this later.

Peirce tells us he draws “a chalk line on the board”. Now, mathematically speaking, a line is an infinitesimally thin – a virtually thickless – plane, and in its own right, it is continuity. Yet when made visible by Peirce’s hand, thanks to white dust particles on a black background, it provides an image of empty continuity – “emptiness” (Buddhist term-metaphor) in wait of a “collapse”, or more recently, “decoherence” (quantum term-metaphors) into something “arising” (Buddhist term-metaphor) and becoming “somethingness”, at least in the minds of those agents who might be “co-participating” (Wheeler’s term-metaphor) with the universe’s becoming. A white continuous surface on a black continuous background-surface. This is, in Peirce’s words, “a reaction between two continuous surfaces into which it is separated, the white surface and the black surface”.

Is the line white and can be nothing other than white? Is the background black and can be nothing other than black? If we wish to remain trapped within Aristotle’s principles of *Identity*, *Non-Contradiction* and *Excluded-Middle* the answer is positive. If we want to take Peirce at his word, it is negative. But if we wish to use these classical logical principles to subvert them by way of Peirce’s ‘logic of continuity’ or ‘logic of vagueness’, we can take Peirce’s next move in the above quote seriously (Brock 1979; Chiasson 1991; Engel-Tiercelin 1992; Loy 1986; Priest 2004). Peirceanly put, then, the Whiteness of the line is such only in the sense that it is “inter-dependent” (Buddhist concept) with Blackness – though Blackness is Non-Whiteness. The Blackness of the background is such only in the sense that it is inter-dependent with Whiteness – though Whiteness is Non-Blackness.

However, the tale has not yet been completely told. Whiteness and Blackness are inter-dependent. This is to say that neither Whiteness nor Blackness is what it is without the *other*: they are “complementary”. In other words, the inter-relation of Whiteness and Blackness is in line with Buddhism, or graphically, comparable to Yin-Yang of the Dao. There is, complementarily speaking, a “spot” of Yin in the Yang, and vice versa. Complementarity is also a keyword regarding Bohr’s Copenhagen interpretation of quantum theory. Bohr’s “particle” and “wave” complementarity come to mind. There can be no wave without the particle as possibility; there can be no particle without its arising from the wave entailing its possibility (Bell 1989; Malin 2001; Smith 1995). “Wavicle”, actually proposed as a portmanteau term combining wave-particle, is comparable to Peirce’s “pairedness” or Buddhism’s inter-penetration: a “coalescence” of the two terms. In the context of this essay, then, might we say that black-white yields “blite” or “whack”?

If we wish to highlight complementarity further, let us consider the nature of the line, or as Peirce dubs it, the “boundary between the black and white”.

He tells us that it is neither black, nor white, nor neither, nor both". The boundary separating the chalk mark from its background is infinitesimal, virtually "nothing". That is to say, it is an imaginary construct made up of chalk dust in order that we may specify it *as* a line of demarcation. *As* purely a border separating *something* from *something else*, it is *neither* Whiteness nor Blackness, and at the same time, as an imaginary "nothing" made visible, it entails *both* Whiteness and Blackness.

What are the consequences of this nature of the boundary? As Non-Whiteness it has something in common with the black background: it is Non-White. As Non-Blackness it has something in common with the visible chalk mark: it is Non-Black. Well, then, in this manner of putting the boundary enigma, practically speaking, the line evinces the nature of both Whiteness and Blackness in the sense of inter-dependency between the two qualities. But the line is *neither* of the two. Like the line between Yin and Yang. Like the ambiguous difference between wave and particle (the wave is no quantum wave unless it is ambiguously linked to a possible particle among an indeterminate number of possible particles, and a particle is no particle unless it is linked to that which made it possibility for becoming a particle).

So, the white line implies Blacklessness and the black background implies Whitelessness – that is, once the white line, a continuum, has emerged from blackness, also a continuum, and the two continua engage in an "inter-penetrative" (Buddhist term) process. As process "goes", so process "is", and as process "is", so process "goes".

What, then, is a boundary? Wheeler emphasizes that a boundary as possibility, that, in the quantum theoretical sense, is everywhere *as* statistical possibility. So what is it *as pure possibility* outside any and all statistically possible considerations? The "boundary of boundaries", Wheeler concludes. Just as zero, originally from Indian philosophy, contains the wherewithal for the creation of an infinity of numbers, so also the boundary of boundaries contains the possibility of Whiteness and Blackness, as well as redness and blueness and sweetness and sourness and frogness and dogness and catness and ratness and so on to the ends of the earth and all possible qualities defining them the world has to offer. So much for riddles entailing complementarity, non-bivalence, vagueness, and ambiguity. Now for categories Firstness and Secondness.

There is no Firstness available *to* the mind *of* the semiotic beholder *as something* in the continuum. As the Dao puts it, from "emptiness" comes One, then Two, then Three, then Many. Or from the continuum comes the white chalk mark. Is the chalk mark Firstness *in* the mind *as* such-and-such? No. Unless and until that such-and-such enters into inter-relations with so-and-so, which is, something *other*, the black background. What is that something *other*? The

blackboard's Blackness, or, metaphorically put, its "emptiness". Once our semiotic beholder has registered Whiteness as a difference that makes a difference from Blackness, it has become the Secondness of the Blackness. And she has registered Blackness as a difference that makes a difference with respect to Whiteness. In the act it has become the Secondness of Whiteness. So Peirce's quote implies.

And Thirdness? It involves the process of a sign evincing *some*, and *possibly all*, its qualities (particular attributes) on its way toward hopefully becoming a *genuine sign*, fully dressed in its *final interpretant*. (I might add that the semiotic implications of this essay depict the process I have in various books and articles symbolized as: $0 \rightsquigarrow \emptyset \rightsquigarrow \sqrt{\bullet} \rightsquigarrow + \rightsquigarrow - \rightsquigarrow \Psi \rightsquigarrow \dots$ Signness [where $0 \approx$ "emptiness", $\emptyset \approx$ the empty set, $\sqrt{} \approx$ the square root of, $\bullet \approx$ both the one and the other and neither the one nor the other – as in $\sqrt{-1}$, $+ \approx$ the possibility of Firstness, $- \approx$ the possibility of Secondness, $\Psi \approx$ the possibility of Thirdness, and where \approx is the approximate equivalence or, \rightsquigarrow is the becomingness of, and \dots is the creation of actual signs]).

Helmut Pape¹

37 Peirce's Process Ontology of Relational Order

What is reality? Perhaps there isn't any such thing at all. As I have repeatedly insisted, it is but a retrodution, a working hypothesis which we try, our one desperate forlorn hope of knowing anything. Again it may be, and it would seem very bold to hope for anything, that the hypothesis of reality though it answers pretty well, does not perfectly correspond to what is. But if there is any reality, then, so far as there is any reality, what that reality consists in is this: that there is in the being of things something which corresponds to the process of reasoning, that the world *lives*, and moves, and HAS ITS BEING, in a logic of events.² (NEM 4: 343, 1898).

The rational meaning of every proposition lies in the future. How so? The meaning of a proposition is itself a proposition. Indeed, it is no other than the very proposition of which it is the meaning: it is a translation of it. But of the myriads of forms into which a proposition may be translated, what is that one which is to be called its very meaning? It is, according to the pragmatist, that form in which the proposition becomes applicable to human conduct, not in these or those special circumstances, nor when one entertains this or that special design, but that form which is most directly applicable to self-control under every situation, and to every purpose. This is why he locates the meaning in future time; for future conduct is the only conduct that is subject to self-control. (CP 5.427, 1905).

The two above quotations seem to address completely different topics: one of them, from the 1898 Lowell Lecture series, addresses a metaphysical issue, that is to say, a question about the ultimate nature of reality. The other, from the 1905 *Monist* article *What Pragmatism is*, discusses the meaning of propositions. But both are intimately connected. To see why this is so, let us begin with the first of the quotations, which discusses reality.

The passage is the only one in Peirce's writings in which reality is explicitly described by means of a hypothesis about its ontology. Only life, movements, events and the logical features of events characterize what reality is. This is a process ontological thesis since it assumes that we can characterize reality only in terms of events. However, there is a puzzle: why does Peirce invoke a "logic of events"? The emphasis on logic implies that events, changes and their interrelations can be understood only if the structural layout of process entities embodies some sort of logical ordering. This is a thesis about logical ordering that says:

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² First published in: *The New Elements of Mathematics* by Charles S. Peirce, Carolyn Eisele (ed.), four volumes in five, The Hague-Paris, 1976. Vol. IV: 343–4.

the process ontological understanding of reality is possible only because reason and reality share some basic relational properties. There must be an isomorphic ordering shared by events of reasoning and nature, and this ordering is captured by the “logic of events”. Surely, this can be nothing else but a logic of the order of events in time.

We will look at the temporal aspect of ordering below in our discussion of the second quote. Let us first answer the general question, what kind of logic is a “logic of events”? I will argue that the logic of events is based on Peirce’s logic of relations. There is a specific notion of relation as a model for logical order that provides the formal background for almost all of Peirce’s philosophical projects. In fact, exactly for this reason, a sort of process ontological reading in which relations function as properties and events as the basic entities, is applicable to Peirce’s whole philosophy. So the first quotation is unique only because it explicitly formulates an *ontological interpretation* in terms of process entities.

Let us turn to the concept of order relations which derives from Peirce’s algebra and logic of relations. It is immediately relevant to the theory of categories, semiotics, pragmatism and evolutionary metaphysics. Of course, I cannot show here how and why this interpretation of order is carried out in each of the philosophical projects mentioned.³ In what follows I will rather describe the notion of order implicit in and crucial for Peirce’s pragmatism. Peirce had proposed the pragmatic maxim (PM), “Consider what effects, that might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object” (CP 5.402), as a rule for increasing clarity of thought. The pragmatic maxim has often been criticized for its alleged obscurity. But if it is understood as a rule that instructs us to look for relations between beliefs, it establishes a fruitful and knowledge-enhancing order between them. This may also be described as the claim that the interpretation of the identity relation between objects of theoretical thought and objects of practical belief provides us with an ordering of beliefs clarifying thought by “focusing” on practical contexts and consequences of the objects of our thought. Why and when does the construction of identity relations between objects of thought and of practical contexts allow such an epistemological consequence? The answer is that Peirce discovered that this outcome can be achieved when order relations are applied.

In an abstract logical form, Peirce began to discover the power of order relations in his epistemology papers of 1868 in which Peirce understands the form

³ In semiotics the concept of an open, repeatable triadic sign-relation implies some such ordering for the sign-relation. If this would not be possible, the recursive structure of ongoing sign interpreting signs could not take place.

of syllogistic rules of inference as the form of reasoning in general and as a method of -generating knowledge. He argues that all inferences are only valid and may increase our knowledge only if they have a general form allowing for transfer of semantic inclusion in order to secure truth. He argues for such a general form of semantic inclusion as follows: Take a premise, P , representing a state of affairs correctly. Consider another proposition, C , that is true about another state of affairs. Represented in this way, it is impossible to deduce C from P . However, C can be deduced from P if we have another premise, Q , to the effect that, regardless of whatever Q will say, it semantically includes C into P . Now, Q will “virtually assert that every state of things such as is represented by C is the state of things represented in P ” (W2: 221). In 1868, Peirce was wrong in assuming that the transfer of semantic inclusion in reasoning already enlarges our knowledge if only one order relational feature – transitivity – holds. He even assumed that semantic inclusion and the generation of knowledge can be sufficiently characterized by the principle of syllogism: $[(P \Rightarrow Q) \& (Q \Rightarrow R)] \Rightarrow (P \Rightarrow R)$.

However, transitive order between propositions will not suffice to explain how knowledge is enlarged by taking into account new cases of practical experiences. Already in 1870, in his *opus magnum* on the logic of relatives (*Description of a Notation for the Logic of Relatives, resulting from an Amplification of the Conception of Boole's Calculus of Logic*, (DNLR), W2: 359–429), Peirce came across some other formal concepts that broadened his approach. He now took into consideration the formal properties required by order relations between the objects of beliefs. In his algebra of relations, the basic inferential relation is inclusion, or “illation”. “Identity” can be captured by an inferential relation, and this basic inferential connection is expressed by “if ... then”. In DNLR Peirce came to see that what constitutes an order relation for which transitivity, reflexivity and anti-symmetry hold must be embodied in a relation that in addition holds in a properly selected universe of discourse. Hence, inferences may become order relations only in properly selected universes, and only then can identity be defined from within the inferential relations in terms of inclusion. This discovery in DNLR is the mathematical counterpart of the identity of objects in order relations. There Peirce tells us that “equality is the conjunction of being as small as and its converse. To say that $x = y$ is to say that $x \prec y$ and $y \prec x$ ”. A footnote explains that “all equality is inclusion in, but the converse is not true, hence inclusion in is a wider concept than equality, and therefore logically a simpler one” (W2: 360 and fn. 1). That the converse does not hold, that not all equality is inclusion, is what structures the special ordered identity relation PM asks us to construct: the relation between theoretical and practical beliefs does not specify relations of equality between objects. It is only possible to establish

relations of equality on the basis of inferential relations if we restrict the selection of objects to a suitable universe of discourse.

With these insights from the 1870 study of the logic of relations, the 1868 mistake – that the transitivity of propositional knowledge already secures the applicability of beliefs – can be corrected. If relevant and suitable beliefs are successfully applied, this cannot depend solely on the existence of a transitive relation between propositions and their objects. The same objection holds if we postulate that the formal requirements should also encompass an order relation of transitivity, reflexivity and antisymmetry. However, though not sufficient, these order relational properties are necessary if we want to establish relevant, empirically informative relations between fully fleshed beliefs. But Peirce used transitivity as one of the crucial features of relations establishing semantic validity. In the semantics for the Existential Graphs, he argued with transitivity in a classical format the *dictum de omni*. If we are to enlarge knowledge, transitivity is what characterizes semantic relations between beliefs in a universe of discourse in which ordered identity relations of objects are accessible.

Viewed from the logic and ontology of relations, pragmatism is a methodology that tells us how to structure inferential relations between our thoughts, beliefs and selections of objects. This is how the relation to practice is effectively established. Pragmatically, thinking takes itself place “in time”, and “in time” thinking contributes to constituting practice. In the algebra of relations, the identity of an object is described in terms of the equality of an object in an order relation such as “inclusion in”. This helps to sort out contingent experiences on the assumption that proper epistemic selection of a universe of discourse can be performed if an inferential relation exhibits some or all properties of such order relations.

But how exactly, does pragmatic thought take place “in time”? Peirce treated time as a hidden, postponed topic on his logical and philosophical agenda, but in his pragmatism and in his process ontological view, as well as in his semiotics, the dynamics of irreversible experiential time was alive throughout his philosophical career. In 1908, he still argues that only the actual sequence of thought events is able to represent adequately illation or what nowadays is called a material conditional “if A then B”.⁴

⁴ He argues that this logical sequence cannot be captured in thinking by its equivalent propositional form that contains two negations. For to think a conditional is to undergo a process of thought that leads from the antecedent *A* to the consequent *B*. Such a logical sequence, figuring as we saw as the logical operation of thought, has irreducibly a process combining thought-signs: “In reasoning, at least when we first affirm, or affirmatively judge, the conjugate of the premisses, the judgment of the conclusion has not yet been performed. There then follows a real movement of thought in the mind in which that judgment of the conclusion comes to pass”. (MS 300, 1908: 00049).

The pragmatic use of order implicitly assumes a temporal feature of ordering by treating “present beliefs” as the starting points and future actions as end points. The second of the two above quotations discusses a variant of a temporal order of actions and events to an arbitrary present moment: They are always *now* meaningful because they can be understood as relating us to *future* actions and events. This future-bound temporal perspective of any present moment opens a space of possibilities for our self-controlled choices and this is what explains the pragmatic meaning of propositions:

How are sentence meaning and self-control connected to human conduct that does justice to the *kairos* of its existence? For example, what will the meaning of my life be, if I exert self-control “in time”? That such a question allows for a meaningful answer may depend on my capacity for self-controlled reasoning. Some reasoning about those propositions that describe, in the course of the *kairoi* of my life, my personal development in face of the opportunities or changes of the reality to which I have access. Only propositions that deal with my possibilities of action in the future are relevant for such deliberative processes. I, or any other person for that matter, can develop the meaning of my life only insofar, as I have the capacity for a self-controlled changes of the purposes and values guiding future actions. A person is a teleological, dynamical system because “teleology is more than a mere purposive pursuit of a predeterminate end; it is a developmental teleology. . . . Were the ends of a person already explicit, there would be no room for development, for growth, for life . . .” (CP 6.156f).

Self-control is rational agency effective in time and context. That is to say, the controlled selection of optional meanings allows us to access what the world means to us. Self-controlled choice of a possible course of events occurs in time when it takes place in an irreversible and ordered sequence of events. Self-controlled choices prepare for a future-bound reality by selecting from possible events a favored course of actions. In reasoning, we selectively generate meaning of propositions by considering order relations towards *some* possible future embodiments of those propositions we believe in. And we can only achieve this by focusing on one semiotic or inferential relation rather than another because self-control is active in the selective choice of possible premises and inferences. Peirce stresses that “all deductive reasoning, except that kind which is so childishly simple that acute minds have doubted whether there was any reasoning there – I mean non-relative syllogism – requires an act of choice; because from a given premiss, several conclusions – in some cases an infinite number – can be drawn” (CP 6.595). Each such selection involves a bifurcation. Only one of two mutually exclusive events is selected as the one that our action will strive to bring about. Every such self-controlled selection of events assumes a temporal

exclusion principle: not every event or action possible is possible at the same time. Consequently, for every event that comes to pass, there is always a set of other unrealized instances of possible *future* events, whereas *past* events take on a unique monotonic linear ordering.

That is to say, meaning, purpose and function share the semiotic side of event relations which depend on their directional, selective or teleological orientation and exemplify what T. Deacon, in *Incomplete Nature* (Deacon 2011) calls an absential feature. Indeed, the “logic of events” governed by the selective and dynamic operation of self-control holds both for semiotic as well as for physical processes. In fact, they are the two sides of one and the same coin – in the same way in which a *type* and its *tokens* cannot be separated. In explicating temporal relations, such as in physical motion, semiotic processes include physical processes in their future-bound orientation, so that the logic of events is part of a system of the future orientation of semiotic relations towards the future. Sign relations are selective, directional, and teleological relations which include, but can never become strictly identical with, relations between actually occurring physical events.

Eugene Halton¹

38 The Degenerate Monkey

One of these days, perhaps, there will come a writer of opinions less humdrum than those of Dr. (Alfred Russel) Wallace, and less in awe of the learned and official world . . . who will argue, like a new Bernard Mandeville, that man is but a degenerate monkey, with a paranoid talent for self-satisfaction, no matter what scrapes he may get himself into, calling them ‘civilization,’ and who, in place of the unerring instincts of other races, has an unhappy faculty for occupying himself with words and abstractions, and for going wrong in a hundred ways before he is driven, willy-nilly, into the right one. (CN 3: 17–18, 1901).

This one sentence, packed into Peirce’s 1901 review of Alfred Russel Wallace’s book *Studies, Scientific and Social*, a two volume work totaling over 1000 pages, was not stated as an explicit expression of Peirce’s own philosophy. But I would like to extrapolate from what I take to be a compacted but sophisticated philosophical anthropology, one that connects to Peirce’s wider philosophy and to a viable way of understanding the human creature today. I suggest that Peirce was a kind of new Bernard Mandeville with a twist, that twist being his depiction of the degenerate monkey.

One of these days, perhaps, there will come a writer of opinions less humdrum than those of Dr. Wallace, and less in awe of the learned and official world . . . who will argue, like a new Bernard Mandeville, that . . .

In the sentences preceding the above quotation, Peirce wrote of Wallace that: “. . . he pronounces monkeys to be rather low down in the scale of quadrupedal life, both physically and mentally. He still acknowledges that man is the crown of the animal kingdom in both respects”. Peirce removes that crown in his understanding of the human creature.²

In his *Fable of the Bees: or, Private Vices, Public Benefits*, which was first published in 1714, Bernard Mandeville skewered human pomp with his view that: “The moral virtues are the political offspring which flattery begot upon pride”. Mandeville believed that the moral virtues conceal a basic selfishness that humans share with other animals. Indeed, they provide the very means to deny that nature. Cooperative human goodness, similar to Hobbes, is an artifice

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² Humans are then not the crown above the “monkey” below, contra Wallace, but by the standard of maturity are even lower by virtue of being physically neotenuous, physiologically less matured developmentally. In the place of a “crown”, Peirce celebrates the human capacity to blunder more than other animals, as I develop later in the piece.

imposed upon primal self-interest. Social cooperation is conceived nominalistically as a conventional invention introduced in the development of societies, rather than an essence of human nature. Thus private vices may become public benefits: “Private Vices by the dextrous Management of a skilful Politician may be turned into Publick Benefits” (Mandeville 1989: 371).

Such a nominalist outlook seems at a remove from Peirce’s realist and naturalist views of signs and sociality.³ Instead, it was Mandeville’s puncturing of that human posturing called “being civilized” that I take Peirce to be alluding to.

In his lecture on “Philosophy and the Conduct of Life”, the first of his eight Cambridge lectures of 1898, Peirce notes that:

The mental qualities we most admire in all human beings except our several selves are the maiden’s delicacy, the mother’s devotion, manly courage, and other inheritances that have come to us from the biped who did not yet speak; while the characters that are most contemptible take their origin in reasoning. The very fact that everybody so ridiculously overrates his own reasoning is sufficient to show how superficial the faculty is. For you do not hear the courageous man vaunt his own courage, or the modest woman boast of her modesty, or the really loyal plume themselves on their honesty. What they *are* vain about is always some *insignificant* gift of beauty or of skill. It is the instincts, the sentiments, that make the substance of the soul. Cognition is only its surface, its locus of contact with what is external to it. (EPII: 31).

Here Peirce inverts the sources of the virtues from Mandeville’s outlook. Where Mandeville saw the virtues as an artifice repressing the self-interests of human nature, Peirce sees the most admirable human qualities as stemming from our ancestral past, “from the biped who did not yet speak”. Motherly devotion and manly courage are instinctive social sentiments. We might say today that such qualities trace back even beyond the biped who did not speak to include a broader range of primate and even mammalian ancestors. Primatologist Franz de Waal (2010) has written about the capacities for empathy in chimps and bonobos, and neuropsychologist Jaap Panksepp (Panksepp and Biven 2012) has argued for subcortical mammalian neurocircuits for caring (or nurturance) and playfulness, among others, revealing a longer neuroevolutionary history for human emotions than simply hominid.

But of our vaunted capacity for rational cognition, Peirce claims that it is superficial in comparison with the social sentiments. Comparing it with the bees, he writes:

³ Social cooperation occurs through the medium of signs. Sociality does not have the same meaning as sociability. Peirce claims that reality is social, and that the social is natural. He claims that signs are intrinsically social. This allows that the public may be real, which Mandeville’s view seems to deny.

Reason is of its very essence egotistical. In many matters it acts the fly on the wheel. Do not doubt that the bee thinks it has a good reason for making the end of its cell as it does. But I should be very much surprised to learn that its reason has solved that problem of isoperimetry that its instinct has solved. Men many times fancy that they act from reason when, in point of fact, the reasons they attribute to themselves are nothing but excuses which unconscious instinct invents to satisfy the teasing ‘why’s’ of the ego. The extent of this self-delusion is such as to render philosophical rationalism a farce. Reason, then, appeals to sentiment in the last resort. Sentiment, for its part, feels itself to be the man. (EPII: 32).

The idea that human beings are rational beings would seem to be amended in Peirce to something like, if I may play with the well-known Shakespeare quotation used elsewhere by Peirce:

Man is by habit a self-deluding rationalizer, an angry ape,
Drest in a little brief authority,
Most ignorant of what he’s most assured,
His mature sentiments. Or more, that . . .

... man is but a degenerate monkey

Peirce’s characterization of humanity as “but a degenerate monkey” beautifully puts what Alfred Russel Wallace thought to be the crown of creation in its place.

Peirce advocated technical scientific terminology that was specialized and univocal. His term “degenerate monkey” is neither specialized nor univocal. But I find it an apt expression to characterize humanity, if one allows the humor that is also part of being human to realize that Peirce knew the difference between a monkey and the lesser and greater apes. But his term puts the human primate in its place, especially in the double meaning of the word “degenerate”. Its everyday meaning is obvious, but there is also Peirce the mathematician using the term “degenerate”. I take it to refer to the genetic falling away from a pure form characterized by human neoteny, such that humans do not mature as quickly as other primates and great apes.⁴

Indeed, humans are born “prematurely” relative to other primates, due in large part to our big-brained heads. Where chimps are born with roughly 45 per

⁴ I am not claiming that Peirce was addressing degeneracy in the current use of the term in contemporary evolutionary theory. Peirce (EPII: 268) says that he “borrowed” the term from geometers and the geometry of conics, but he applies it elsewhere to phenomena such as degenerate Secondness and types of sign degeneracy which have nothing to do with conics. The Concise Encyclopedia of Mathematics states: “In mathematics, a degenerate case is a limiting case in which a class of object changes its nature so as to belong to another, usually simpler, class” (Weisstein 2003: 689).

cent of final brain size, humans are born with only roughly 25 per cent (Iriki & Taoka 2012). Hence ex utero humans engage in more brain building that occurs in utero for other primates. In this sense we are less-developed primates at birth, but more developmentally biosocial, because more of the human brain building is occurring in a socializing milieu. Progressively cooperative practices, including parenting and food gathering involving immatures as well as adults, mark the emergence of the human socializing milieu.

From birth, the human newborn baby comes equipped to communicate with its mother in precise dialogical gestural repartee, not because it is “rational”, because the synaptic connections of the prefrontal cortex have yet to be made, but because the subcortical infant brain comes equipped to engage interactively within hours of birth, as Meltzoff and Moore (1977) and Trevarthen (1980), have shown. Stephen Malloch and Colwyn Trevarthen (1999: 4) have demonstrated the complex “communicative musicality” of weeks old infants, capable of correctly phrasing their part in bantering repartee with the mother. This tactile and vocalizing “musicking” between infant and devoted mother/caretaker is a conversation of gestures through which, over early development, symbolic communicative capacities will be able to emerge.

... with a paranoid talent for self-satisfaction, no matter what scrapes he may get himself into, calling them ‘civilization’

Civilization is usually taken to be an achievement of progress, yet Peirce’s characterization of it as the “scrapes” that the degenerate monkey gets into, as a result of its “paranoid talent for self-satisfaction”, seems anything but that. Peirce was a profound student of history, well aware of the excesses that entered into civilization, as well as of its blessings. But it wasn’t until a half century later that we began to understand the huge costs that figured into the rise of agriculture, settlement, and civilization. The domestication of plants and animals, and settlement, culminating in cities and civilization, marked a profound transformation of humanity, physically and mentally.

About 11,000 years ago, as archaeologist Dr. Ofer Bar-Yosef, whose team discovered the earliest cultivated figs from around that time, noted, “. . . there was a critical switch in the human mind – from exploiting the earth as it is, to actively changing the environment to suit our needs. People decided to intervene in nature and supply their own food rather than relying on what was provided by the gods” (cited in Wilford, 2006: Online newspaper).

Recent accounts of civilization show the massive costs of changing the environment to suit our needs. The blessings of agriculture may have also been a curse whose consequences continue to mount. The fact is that nutrition deteriorated severely for the bulk of people in civilizations throughout the world, including the new world, and average heights dropped 4 to 6 inches (Eaton,

Shostack & Konner 1988). Populations increased. Mass-killing warfare by specialized warriors was invented, social inequality became far more pronounced, and was institutionalized under the invention of divine kingship and associated elites. In many ways life under civilization became short, nasty, and brutish, contra Hobbes, even while it attributed its own shortcomings onto its foraging ancestors. The removal of mind from a transaction with living habitat to domesticated landscape, walled cityscape, and texts marked a profound historical transformation: a sacralization of the human, in the forms of gods, kings, and saviors, and a desacralization of the wild habitat (Halton: in press).

If humans were possessed of the unerring instincts of other races, this disconnect from wild habitat attunement may not have been a problem. But . . .

... and who, in place of the unerring instincts of other races, has an unhappy faculty for occupying himself with words and abstractions, and for going wrong in a hundred ways before he is driven, willy-nilly, into the right one.

In the year after Peirce's review of Wallace was published, he wrote again on the theme of neoteny⁵ and the relation of fallibility and plasticity:

The Rational mind is the Progressive mind, and as such, by its very capacity for growth, seems more infantile than the Instinctive mind . . . One of the most remarkable distinctions between the Instinctive mind of animals and the Rational mind of man is that animals rarely make mistakes, while the human mind almost invariably blunders at first, and repeatedly, where it is really exercised in the manner that is distinctive of it. If you look upon this as a defect, you ought to find an Instinctive mind higher than a Rational one, and probably, if you cross-examine yourself, you will find you do. The greatness of the human mind lies in its ability to discover truth notwithstanding its not having Instincts strong enough to exempt it from error. [This is the marvel and admirable in it; and this essentially supposes a generous portion of the capacity for blundering". (Peirce's marginal insert)] (CP 7.380).

⁵ Peirce is describing the phenomenon of neoteny, though not using the term, as becomes clearer in the continuation of this quotation, CP 7.381, which appears below on the next page, where he discusses, "the prolonged childhood of men. . ." The term neoteny, coined in 1884 by Julius Kollman, had not yet entered into wide use, though the idea describing the phenomenon had begun to be discussed, such as that by Havelock Ellis in 1894. Montagu notes in his 1983 work on neoteny that, "During the first decade of the twentieth century fetal traits as a source of adult features in humans were recognized by a number of biologists" (1989: 212). The term neoteny only entered into English usage in 1901, the year of Peirce's entry, though some discussion using the term had begun in Europe, such as Danish zoologist J.E.V. Boas's writing in 1896. Peirce, characteristically, was picking up on the emerging discussions of the idea.

A generous “capacity for blundering” seems quite the opposite of the term for anatomically modern humans, *homo sapiens sapiens*, the wise human. Perhaps if Peirce had had his way, we would be using instead the term *homo errans*, the blundering human. Yet Peirce views the degenerate monkey’s capacity for blundering as a marvel to be admired, and when one remembers that he is also the founder of fallibilism, one understands why. This “more infantile” rational mind is not set adrift in its blunderings, but has a plasticity that is yet informed by “instinctive mind”. It is the mind embodied especially in the newer prefrontal cortex and its connections, but those connections remain potentially informed by robust sensings of instinctive mind from down below, and from without. For the degenerate monkey evolved as what native Americans call “children of the earth”, attuned to the circumambient instinctive intelligence of the wild others it hunted and gathered.

The term “children of the earth” is an apt description of the degenerate monkey and its newly sprung neotenus mind, its vaunted rationality being still the child in the community of human passions. As Peirce put it:

The conception of the Rational Mind as an Unmatured Instinctive Mind which takes another development precisely because of its childlike character is confirmed, not only by the prolonged childhood of men, but also by the fact that all systems of rational performances have had instinct for their first germ. Not only has instinct been the first germ, but every step in the development of those systems of performances comes from instinct. It is precisely because this Instinct is a weak, uncertain Instinct that it becomes infinitely plastic, and never reaches an ultimate state beyond which it cannot progress. (CP 7.381).

Peirce’s account of the blundering rational mind as an “Unmatured Instinctive Mind” puts rationality in its place in the community of passions, while yet allowing its plasticity the genius of abductive inference, the capacity for informed guessing through broadened sensing from instinctive mind percolating through immature rational mind: Our weakness from instinctive determination as also our strength in sensed instinctive promptings.

A few paragraphs further in this discussion Peirce asks, “What the first religion was like one would give something to know” (CP 7.384). The distinguishing of the foraging legacy from agricultural settlement was a finding made only decades later, yet today we might answer Peirce using Paul Shepard’s term, “the sacred game”, as the source of the emergence and reality of religion.

Humans emerged in reverential attunement to the wild circumambient life they tracked, gathered, mimicked, dreamed, danced, and ate. It was in this relation to living habitat, the living earth itself, that the human mind bodied forth. For there was mature instinctive genius to be learned. Peirce: “Look at the little birds, of which all species are so nearly identical in their physique, and yet what

various forms of genius do they not display in modeling their nests? This would be impossible unless the ideas that are naturally predominant in their minds were true. It would be too contrary to analogy to suppose that similar gifts were wanting in man” (CP 5.604). By close attunement to the genius of the nests of birds and other creatures, humans could learn how to create shelters. By close attunements to the songs of birds, humans could discover the music that was already in the air, a practical music signaling movement in the habitat for over a kilometer away, while also a real art to be internalized, and perhaps a real syntax to be mimicked and sung, and then eventually put into words.

Hence the degenerate monkey emerged immersed in the sacred game. But in thinking itself clever, in thinking from its immaturity that it could domesticate and control the game by creating a dematured, domesticated version that would allow it to grow exponentially, it may have begun the process of fatally disconnecting itself from the very sources of its maturity.

What civilization means has moved from the measure of progress to the measure of a globe gone awry. 90 percent of the great sea predators are gone, while humans have expanded to over 7 billion people. Global warming estimates are self-correcting ever upward. Industrial agricultural practices, such as the over-use of antibiotics, threaten human life. We know that industrial civilization is not sustainable as practiced today. Already, the year after Peirce’s review appeared, historian Henry Adams expressed in a letter to his brother Brooks on August 10, 1902, that: “My belief is that science is to wreck us, and that we are like monkeys monkeying with a loaded shell; we don’t in the least know or care where our practically infinite energies come from or will bring us to” (1938: 391–392).⁶

Science and technology, as conceived in nominalistic civilization today, that is, in the image of the schizoid machine, may be manifestations of humanity’s final scrape, its suicidal infantilization. Yet science, as Peirce conceives it, as a living pursuit, may suggest a way of reconnecting to the genius of nature in modern form (Halton 2005). Science itself has limits in being primarily theoretical for Peirce, and perhaps that suggests the limited role for the unmatured rational mind as requiring a learning habitat in the context of its more matured sentiments, consistent with Peirce’s philosophy of critical common-sensism. Who knows but that a more humble conception of humanity, not as the crown of creation, but as the degenerate monkey, whose maturity hinges on attunement to, respect and even reverence for the living earth and its limits, might not suggest a model of sustainable civilization?

⁶ I am not claiming that Adams’ position represents Peirce, only that it was made a year after Peirce’s review. Peirce may have been a champion of science in general, but he was a critic of nominalism and of nominalistically conceived science. Peirce provides a way to reconstruct nominalistic science so that its “monkeying” around will not “wreck us”.

Mi-Jung Kang¹

39 On Digital Photo-Index

... As because it is in dynamical (including spatial) connection both with the individual object, on the one hand, and with the senses or memory of the person for whom it serves as a sign, on the other hand. (CP 2.305, 1901).

Can digital photographs be regarded as indices like analogue ones, despite the fact that the technology of photography has changed drastically since its inception? In the search for the identity of photography, many contemporary photo-theorists have tended to regard it as a kind of index following the footsteps of Charles S. Peirce, and every so often, photographs have been treated as traces of the real in their writings². But the validity of the ‘photo-index theory’ has been questioned since the wide spread of digital cameras in the 1990s.

Since the Peircean index is usually defined as a sign which has a direct physical (i.e., causal) connection with its object, a number of photo-theorists have cast doubt on the notion that a digital photo can be an index on the grounds that no physical causality is found between a digital photo and its object.³ It is not altogether clear, however, that this kind of *direct physical* relation is what Peirce had in mind when he said that an index is “real thing or fact which is a sign of its object by virtue of being connected with it as a matter of fact and by also forcibly intruding upon the mind, quite regardless of its being interpreted as a sign” (CP 4.447). My doubt was raised when I saw Brian Walski’s documentary picture taken at the Iraq War in 2003. (See the picture below) Controversy surrounding this composite picture, a combination of two different source photos, eventually led Walski to resign from his job at *The Los Angeles Times*.

All digital photos can be regarded as Peircean indices when Peirce’s actual notion of index is closely examined, although some digital composite photos must be treated as *sub-indices or hypo-seme* depending on their types. Before addressing these different types of digital photos and indices, I will first provide a contextual basis for a broad overview on what an indexical sign is.

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² Among those are Philippe Dubois, Rosalind Krauss, Denis Roche, Pascal Bonitzer, Henri Van Lier, Jean-Marie Schaeffer, etc. (Refer to Krauss, Dubois, and Lefebvre).

³ Scholars who pursue this line of thought include W. J. Mitchell 1992; Martin Lister 1995; David Tomas 1996; Gören Sonesson 1989; Young-Joon Lee 1998; Joon-Seong Yoon 2004 and many others.



Picture 1: the composite photo by Brian Walski appeared in *The Los Angeles Times* (2003).



Picture 2: the source files

Signs are classified in relation to their objects, giving rise to Peirce's well-known trichotomy of signs: icon, symbol, and index. An icon is a sign whose appearance is similar to its object, since an icon and its object should share the same qualities. According to Peirce a symbol is identified with a sign "which refers to the Object that it denotes by virtue of a law, usually an association of general ideas" (CP 2.249). On the other hand, an index is a sign which is physically connected with, or, which "points to", its object. Unlike the icon and symbol, which are considered general, the index must be individual; otherwise, it cannot physically connect to its object.

The distinguishing attributes of the indices, as described above, were explored by Thomas Goudge in the 1960s. Among his several points about the index, perhaps the most important is that of its being the "identifying sign", because

“identification is accomplished only by means of an index” (52–53). Although every sign represents its object, it cannot provide the whole truth about the object since “a sign is something which stands to somebody for something in some respect” (CP 2.228). According to Peirce, every sign not only has its own interpretant, but also is itself an interpretant of the preceding sign. In other words, no sign can represent its object without mediation. An exception, however, could be made when it comes to the interpretation of the index since it is “in dynamical (including spatial) connection both with the individual object, on the one hand, and with the senses or memory of the person for whom it serves as a sign, on the other hand” (CP 2.305). For instance, the Pole Star which is in spatial connection with the direction of north, is also an index since it allows us to identify the north sky when we find it.

Goudge sorted out six distinctive features of indices in the same paper and provided an initial guideline for differentiating indices from icons and symbols. Among the six characteristics of indices, the first and second ones illustrate his most important points: “(1) an index has a direct physical [i.e., causal] connection with its object, . . . (2) an index exerts a compulsive influence on its interpreter, forcing him to attend to the indicated object” (53). With Goudge’s characterization of the indices, however, one must exclude many examples that Peirce himself provided from the group of genuine indices because of their lack of physically direct connection with the objects.⁴ Hence, Goudge concludes that Peirce could not establish a comprehensive and coherent theory of indices. Pole Star, in accordance with his argument, is an instance that betrays Peirce’s failure in providing a consistent theory of indices, since it merely has spatial connection with north sky but lacks any causal relation with it. Yet, Peirce would not have accepted Goudge’s definition of genuine index, when he mentioned that “If the Secondness is an existential relation, the Index is genuine. If the Secondness is a reference, the Index is degenerate” (CP 2.283).

More recently, Albert Atkin (2005) has identified five characteristics that all indices should have. (163–164) Unlike Goudge, he does not argue that Peirce regarded direct physical connection between an index and its object as an integral part of index theory. The first and foremost feature of the indices that Atkin distinguishes is called the ‘significatory feature’: “Indices use some physical contiguity with their object to direct attention to that object”. This feature has two components: physical contiguity and attention directing. To grasp the significance

⁴ Goudge interpreted Peirce’s distinction between ‘genuine’ and ‘degenerate’ indices as depending whether they have causal relations with the objects. (55–56) His reference is Peirce’s distinction between ‘designation’ and ‘reagent’ that appears in CP 8.368n. Yet, I cannot find any clue that reagents or genuine indices are in the causal relation to their objects.

of the feature with two components, you may recall Peirce's triadic definition of signs, for instance, that which appeared in CP 2.228: "a sign is something which stands to somebody for something in some respect". In his definition, Peirce distinguishes two major relationships – 'sign-object' and 'sign-interpretant' – and notes that every kind of sign, including icon and index, should be considered in the context of these relationships, no matter how weak they may be. Based on the fact that Peirce has never restricted indexical relations to the causal ones, Atkin calls the first component "physical contiguity", not physical causality.

Because an index has a direct connection with its object, the role of the interpreting subject is minimized. *Minimal as the role may be*, it also needs to be interpreted as a sign. Interpretation of an index is largely determined by its object because "the characteristic function of the index" is "forcing the attention upon its object" (CP 2.357). Therefore, we interpret an index in terms of its dynamical relationship to the object. An index directing attention to its object is about producing interpretants of the sign. When Peirce said that "Index, which is a Sign whose significance of its Object is due to its having a genuine Relation to that Object, *irrespective of the Interpretant*" (CP 2.92; my emphasis), his point was not that the index cannot have interpretants, but rather that an index can function as a sign without producing any actual interpretant.⁵

The five features of the indices that Atkin identifies are good references to discern the identity of index. Besides the aforementioned significatory feature, the other four features of the indices are independence, singularity, indicatory, and phenomenological ones (163–166). The independence feature, derived from Peirce's statement that "an index . . . is a real thing or fact which is a sign of its object . . . quite regardless of its being interpreted as a sign" (CP 4.447), refers to the relation between an index and its object which is independent of its interpretation, because the index and its object are real.⁶ Regarding the third feature, singularity, Peirce elaborates on the index as a sign "which like a pronoun demonstrative or relative, forces the attention to the *particular* object intended

5 An index could be a sign without any 'actual' interpretant. Around 1905 Peirce discriminated three kinds of the interpretants such as immediate, dynamical (i.e., actual), and final one. (SS: 111) According to him every sign has its immediate interpretant as the potentiality for future interpretation. (Short 2007; Kang 2009) So, we can say that every index has an immediate interpretant, if not actual one.

6 A fuller account of Peircean concept of reality would be beyond the scope of this paper. However, a few remarks seem to be needed here. For Peirce the real is independent of interpretation, while it is conceived of as the object of truth that should be found by the infinite community of interpreters in the long run. This is the most controversial claim in Peirce's pragmatic semiotics because it doesn't seem clear whether reality is independent of the mind that interprets it or not. He convincingly solved this problem by dividing two kinds of objects: immediate and

without describing it” (CP 1.369; my emphasis). It is due to the singularity feature that an index and its object can make an inseparable pair since it involves the existence of its object. (Gouge: 53–54) Fourthly, the indicatory feature is derived from Peirce’s statement that “indices assert nothing” (CP 2.291), but Instead they just point it out. The final feature that Atkin identifies as indexical is concerned with the category of secondness: the relation between an index and its object shows the brute existence of a phenomenon. (CP 2.283) Indices, unlike icons or symbols, do not have to resemble or share law-like relation with their objects. However, it must be made clear that the possibility of classifying the signs do not deny the fact that all three signs are in continuum. The general such as an icon and a symbol cannot designate the object without indices that embody the quality of an icon and exemplify the law of a symbol.

Following the above explanation, a certain phenomenon can be classified as an elementary index if it satisfies all of the features Atkin described. Conversely, others that have only some of the features can be treated as sub-indices such as proper names, personal demonstrative, or relative pronouns.⁷ Let me get back to the question I raised in the beginning: are digital photos indices? In order to address this question, it is necessary to distinguish the different types of digital photos.

There are three different kinds of digital photos: original picture files and two different types of composite pictures. The first one refers to pictures that are not altered or fabricated. If we don’t consider physically causal relation between an index and its object as an integral feature of it, an original file produced by a digital camera may be treated as an index according to Peirce, who said that “a photograph, for example, not only excites an image, has an appearance, but, *owing to its optical connexion with the object*, is evidence that that appearance corresponds to a reality” (CP 4.447; my emphasis). Following this,

dynamical object. The one is “the Object as the Sign itself represents it, and whose Being is thus dependent upon the Representation of it in the Sign” and the other is “the Reality which by some means contrives to determine the Sign to its Representation”. (CP 4.536) For Peirce, reality or the dynamical object can only be known by the inquirers’ community which would continue to pursue the inquiry, not by an individual inquirer. Consequently, it could be said that reality is independent of the individual mind, but not of the mind in general.

⁷ Although Atkin named this kind of indices ‘index simpliciter’, but I prefer the term, ‘elementary index’ as used by Sonesson. Atkin distinguishes 3 kinds of indices such as index simpliciter, sub-index, precept, whereas Sonesson classifies indices as elementary and secondary ones. (See Atkin 2005: 170 and Sonesson 1989: 63). According to Sonesson, secondary indices are the signs, “where the indexical relationships holds between objects which in themselves are signs [e.g., symbols] already constituted in other way”. I’ll consider his ‘secondary index’ as an alternative term for ‘sub-index’ or ‘hypo-seme’ though Peirce didn’t used them very often. (See CP 2.330, EPII 274).

it is acceptable to consider original files made by digital devices as indices. Then, what about digital composite photos? Some composite photos are sub-indices that have fictional references, thereby lacking independence and phenomenological features, as Peirce described a fiction as opposed to an external reality. (CP 5.405) A composite photo of Hamlet, a fictional character, is an example of this category which depends on the interpretational convention.

Not all composite photos, however, are to be regarded as sub-indices. To demonstrate this point, let us reconsider Brian Walski's documentary photo which was derived from two originals. Despite the alteration, it could be said that the final image indicates the real state of affairs at the Iraq War in 2003. Our common-sense allows us to consider the event that Walski has captured as a real, individual state of affairs which occurred at the time. One might say two different moments have been composited in one picture, but, following Peirce, it could be also said that "single units, single collections of units, or single continua" (CP 2.306) are particulars (CP 2.306). Therefore, Walski's digital photo can be classified as an elementary index just like the Pole Star and any analogue photos.. Peirce's pragmatic realism provides a theoretical ground on which we can render Walski's picture as an index of a certain real thing. In his scholastic version of realism the universals are real, while the individuals are instances of reality. The state of affairs that Walski has captured can be described by this statement: "An American soldier was deterring one of the refugees holding his child in his arm from standing up". From Peirce's viewpoint, Walski's composite photo is an index that exemplifies the concept referred to by the statement, a symbol.

Many identify 'indexicality' as causal relationship between a sign and its object. In particular, the defenders of the 'photo-index theory' consider photos as the evidences of the past existence of people or facts. While their interpretation is not totally misguided, it fails to present the whole picture regarding Peircean indices. To see the whole picture more clearly, we need to remind ourselves that when Peirce was talking about the three kinds of signs – that is, icon, index and symbol – he was mainly concerned with linguistic or symbolic signs. These were of specific interest to him because of the function they served in his logical scheme of semiotics. As individuals, the indices indicate the universal, embodying the Firstness (or quality) and exemplifying the Thirdness (or concept). With this fact in mind, I have explained how one can regard digital photos as indices. In most cases, they are elementary indices that have all the features of the indices, unless they refer to the fictional.

Tyler James Bennett¹

40 Semiotic Propedeutics for Logic and Cognition

Esthetics, therefore, though I have terribly neglected it, appears to be possibly the first indispensable propedeutic to logic, and the logic of esthetics to be a distinct part of the science of logic that ought not to be omitted. (CP 2.199, 1902).

About aesthetics Peirce “must confess that, like most logicians, I have pondered that subject far too little” (CP 2.197). He admits that he knows little about aesthetics but grants that, as one part of the trichotomy of the normative sciences, logic depends on it (CP 5.121). In the pursuit of a Peircean logic of aesthetics progress has been made mostly by semioticians, specifically Douglas Anderson (2005a), Susan Petrilli (2005), as well as Frederik Stjernfelt (2007) Umberto Eco (1997), as well as the work compiled in the voluminous *Peirce and Value Theory: On Peircean Ethics and Aesthetics* edited by Helmut Parret (1994). In each of these cases Peirce’s theory of abductive inference is central.

Abduction is the form of inference responsible for any new idea and that is the least beholden to concepts (CP 5.171). Stjernfelt’s work is especially persuasive because he stresses Peirce’s Kantian inheritance, particularly the connection between abductive inference and Kant’s reflective judgment, which Kant developed specifically for the description of aesthetic reception. By this line of argument, the aesthetic object resists interpretation by pre-conceived conceptual schemas. Aesthetic reception always entails the production of unforeseen hypotheses: abductions. This picture of aesthetics confers great cognitive import upon the function of art as such, much of which is in line with contemporary findings in recent cognitive science (Fauconnier & Turner 2002; Lakoff & Johnson 1999). This link is here developed, with the additional insight that all instances of semiosis in the world partake of abduction. Operations within the conceptually pre-determined realm that can be completely described by deductive and inductive inference may stand as conditions of possibility for potential semiosis, but by the Tartu biosemiotic definition do not themselves constitute semiosis, which always involves creative interpretation in the encounter with incompatible codes, i.e. objects which cannot be classified according to established conceptual schemas. There is an aesthetic moment in every instance of semiosis.

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To describe the place of aesthetics in science Peirce uses the word “propedeutic”. A propedeutic in the simplest sense is an aid or piece of assistance. More technically, propedeutics are educational courses or introductions to more complex disciplines. When Peirce writes that aesthetics provides a propedeutic to logic he means it literally. In CP 1.191 Peirce outlines his trichotomy of the normative sciences in the following order: 1: esthetics, 2: ethics, 3: logic and, as is well known, the order in his trichotomies is never random. Aesthetic reception abductively furnishes the material upon which deduction and induction perform their operations. Aesthetics is the firstness of the trichotomy of the normative sciences just as abductive inference is the firstness of the trichotomy of arguments. These observations are in line with Peirce’s numerous other comments on abduction to the effect that all new hypotheses are abductive (CP 5.171).

The specific connection between aesthetics and abduction is nowhere directly expressed in Peirce’s available collected papers. He notes that aesthetics is prior to logic. He notes that abduction provides the material upon which logical operations work, but he does not go so far as to make the connection between abduction and aesthetics. It is because of this omission that some logicians would restrict the use of Peirce’s work for more instrumental domains, and even claim that semiotics and Peircean logic are incompatible (Short 2007: ix). Because this omission has led to such unfortunate divisiveness it is important to trace the origins of Peirce’s theory of abduction, in order to argue beyond reasonable doubt that logic as such depends on aesthetics, and that therefore Peirce’s semiotics is well suited to the analysis of aesthetic or artistic texts, which is the classic task of semiotics.

As mentioned, this heritage is squarely located in Kant’s *Critique of Judgment*, where the theory of reflective judgment is developed for the description of the subject’s encounter with aesthetic objects. “Judgment in general is the faculty of thinking the particular as contained under the universal. If the universal (the rule, the principle, the law) be given, the judgment which subsumes the particular under it is determinative. But if only the particular be given for which the universal has to be found, the judgment is merely reflective” (Kant 2005: 15). Determinative judgments in this comparison are equivalent to deductive and inductive inferences, and reflective judgment can be seen as equivalent to abductive inference. Judgments technically differ from inferences in that they are less certain. The propositional structure of inferences includes more conditions than that of judgments. In this sense one could say that abductive inferences are closer to judgments than they are to inferences *per se* because they are less beholden to concepts and therefore less predictable, whereas deduction and induction are more certain and more beholden to concepts. This connection is well described by John Kaag in an extensive comparison of Peirce and Kant’s

Critique of Judgment (Kaag 2005). Also the connection between reflective judgment and abductive inference is clearly demonstrated by Stjernfelt (2007: 68).

Aesthetics as a discipline traditionally brackets theories of art as such, restricting the scope of discussion about aesthetics to perception and schematization. That being said, the crucial position of aesthetics in this theory indirectly confers immense importance upon art as such and the analysis of artistic objects, as it is these objects which are intentionally designed to resist conceptual reduction and easy schematization, a point which Kant stresses in the *Critique of Judgment*. Any object whatever can be aesthetic for someone, but it is only the artistic object which is designed specifically for that purpose. Moreover, similar conclusions about the place of art in cognition have been reached by Terrence Deacon, who discusses the principle of aesthetics in the context of neuroscience and conceptual blending (Deacon 2006: 37; 42).

The position of aesthetics in Peircean logic is indisputable but, on the contrary, even the classification of signs and the trichotomies in question (Peirce's "semiotics") occupy a relatively small corner of his vast collected writings as a whole. This restriction of Peirce's writings for the description of semiosis can be narrowed even further so as to defend even more securely the use of at least one piece of Peirce's system for the description aesthetics and semiosis. We might do so by maintaining that all instances of semiosis partake of abduction, and that therefore any deductive or inductive procedures that do not involve the creative generation of new interpretants, but instead unreflectively process data through pre-conceived schema, do not entail semiosis at all. Peirce's theories on formal symbolic reference and the characteristics of legisigns can be placed at the opposite end from abduction – they are types of possible signs but sometimes entail no semiosis whatsoever. It is taken even further by Winfried Nöth for example, in his "The Life of Symbols and Other Legisigns" (2013), where he argues that these sign types in fact discourage semiosis on the part of biological agents.

This interpretation of the classification of signs is in line with both with Tartu biosemiotics as well as the Tartu-Moscow definition of semiosis maintained by Juri Lotman. In the first case, semiosis cannot exist independent of living interpreters. There may be conditions of possible semiosis independent of specific instances of biological subjectivity, however signs themselves do not exist independently of the abductive act, the living aesthetic encounter with the unfamiliar. In the second case, we may define this act as Juri Lotman does: a semiotic system cannot exist without the intersection of at least two incompatible codes (Kull 2012: 330). It is only in this situation of untranslatability that new interpretations, new schemas, new abductions, occur. Additionally, the comparison of Lotman and Peirce is no incidental happenstance as they

both derive some of their theories from the same source, the writings of Immanuel Kant (M. Lotman: 2000; Kaag 2005), specifically the *Critique of Judgment*. In particular, Lotman's writings on iconism and creativity in *Universe of the Mind* (2001), defamiliarization and patterns of equivalence in *Structure of the Artistic Text* (1977), and the aesthetic catalysis of cultural evolution in *Culture and Explosion* (2009), keenly anticipate the contemporary link between aesthetics and cognition, whose forerunners increasingly turn to Kant and theories of schematization.

Two final implications arise. The first is that Peirce's metaphysic may be retained for biosemiotic inquiry only if we maintain that, where the conditions of possible semiosis indeed do extend throughout the universe independent of life, semiosis as such is always dependent on biological or cultural life. The second is that, if we accept this definition of semiosis, the study of the interpretation of artistic texts as developed by the Tartu-Moscow school and specifically Juri Lotman yields insights that reach far beyond the traditional realm of art theory, into for example neuroscience as Deacon describes, into cognitive semantics (Lakoff & Johnson 1999), and into conceptual blending (Fauconnier & Turner 2002). Creativity is essential even in these more instrumental domains – a synthetic semiotic account of aesthetics can provide the propedeutic for such domains as might otherwise take on a life and agenda of their own.

Anne Freadman¹

41 The First Correlate

... nothing does speak for itself, strictly nothing, speaking strictly. One cannot bid his neighbor good morning, really, effectually, unless that neighbor supplies the needed commentary on the syntax. If he does not, I might as well shake a rattle. (MS 427: 145–6, 1902).

The first sentence of this remark reiterates Peirce's long held position, that nothing "speaks" – is intelligible, can be known – without signs. Put this otherwise: no thing is an object in and of itself. It is an object only insofar as it is the object of a sign, thus entering into the processes of intellection. Peirce then specifies that the same principle applies to the interpretant: the greeting is a sign, but no sign is "effectual" in and of itself. It needs an interpretant. Put this otherwise: a sign is like any other thing, and hence must itself be constituted as an object of knowledge in the semiotic process it instigates. Only then can it "speak". In order to generate a valid interpretant, the addressee must take the sign's "syntax" as an object, as a condition of knowing anything that the sign purports to tell.

The validity of the observation is demonstrated *a contrario*: if indeed, seeing one's neighbor, one were to shake a rattle, would she not need to parse the signal, the sign, in order to work out if it was meaningful and if so, of what? And probably fail to do so, being blocked at the very point that Peirce is concerned with here, the distinction between the sign as object constituted by its own rules and material properties, and the object to which it may ultimately refer. Unfamiliarity with those rules, that constitution, would prevent the addressee from knowing if she was being rattled at or to, and hence from being effectively addressed, let alone to what effect.

The remark is found in one of the manuscripts of the *Minute Logic*, dated 1902. Its context is not an elaboration of the semiotic: it is a parenthetical remark, made in the course of Peirce's work on the classification of the sciences. He has just proposed a complex principle of cross-classification, represented by a table; he breaks off to comment on the table itself, taken as a representation. A more familiar instance of a tabular representation for which Peirce provides an "accompanying explanation" is the triangular diagram of the ten classes of sign (resulting from three trichotomies) from the *Syllabus* (1903) (EPII: 296). This explanation is not a restatement of the rationale for the classes, but an account

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of the way the table works to “exhibit” the “affinities of the ten classes”. An alternative version of the table is provided in a letter to Welby (EPII: 491), where Peirce again gives the rule for reading the table. For both cases, we could adopt Peirce’s use of the word “syntax” as a legitimate extension of its standard usage – the rules of connection and relation of the parts of a sign to convey meaning collectively (*Shorter Oxford Dictionary*). The question is what weight we should give a parenthetical remark. Is it a principle? Does it have a history? What are the implications of affirmative answers to these questions?

Sketch of a History

(a) First period

Peirce suggests in the quoted remark that we must apprehend the sign *qua* sign as a condition for apprehending what it represents: the sign *qua* sign is itself an object of apprehension, an act that is itself interpretive in nature. I must take it as a sign before I can know, or ask, of what it is a sign. The phenomenology of signhood thus depends upon a formal distinction between two moments of interpretation and their respective objects, one of which is the first correlate, and the other, its relation with the second. This distinction is familiar from very early in Peirce’s work on signs. In the “Consequences of Four Incapacities”, for example, we read a clear account of two properties of signs, the first being that “the thought-sign stands for its object in the respect which is thought”, and the second being “the material qualities” of the sign “which belong to it in itself, and have nothing to do with its representative function”; these are exemplified by the orthography of a written word, the two-dimensionality of a picture, or the copula of a proposition, which is what fits that sign to make a truth-claim and hence to be submitted to the critical work of logic:

Now the representative function of a sign lies neither in its material quality nor in its pure demonstrative application; because it is something which the sign is, not in itself or in a real relation to its object, but which it is to a thought, while both the characters just defined belong to the sign independently of its addressing any thought. (W2: 225; 1868).

Peirce reiterates this point, with some of the same examples, in 1873, adding that acquaintance with the “distinctive characters” of the sign is the *sine qua non* of “penetrating to [its] meaning” (W3: 65; cf. also 66–7). He stresses in these and other passages that the sign is a “thing”, and indeed an “object” (eg. W3: 77; 1873).

Following these early pronouncements, there is no further explicit general consideration of the characters of a sign irrespective of its representative function until (as far as I can make out) 1903, when he renews his interest in semiotic. However, prior to 1903, there is attention paid to this matter in particular respect of the icon. Excluded from semiotic in the “New List” alongside the index, on the grounds that logic has no interest in signs other than symbols, the icon becomes central when Peirce began to investigate the importance of diagrams in mathematics. Thereafter, he expands the use he makes of the icon and multiplies examples of it.

(b) Second period

In 1885, when Peirce applies his semiotic to the description of his algebraic notation, he defines the icon as standing for an object “merely because it resembles it”; the object is thus difficult to grasp apart from its representation (W5: 163, 1885). Unlike the “likeness” of the “New List”, the icon is crucial to the art of reasoning:

... reasoning consists in the observation that where certain relations subsist certain others are found, and it accordingly requires the exhibition of the relations reasoned with in an icon. (W5: 164, 1885).

As for algebra, the very idea of the art is that it presents formulae which can be manipulated, and that by observing the effects of such manipulation we find properties not otherwise to be discerned.... These ... patterns ... are the *icons par excellence* of algebra. (ibid.: 165).

The definition in force for the rest of the decade is that “the icon represents its object by virtue of resembling” (W5: 380, 1886), or “imitating” it (EPII: 5, 1890). However, Peirce comes to question the notion of resemblance and even of likeness (EPII: 13, 1895). We are on the cusp of a significant change.

(c) Third period

The importance of the icon is understood to pervade logic in general, not only algebra (W8: 24, 1890), and while Peirce at this point insists that ordinary language cannot reveal the nature of formal reasoning, it is remarkable that, from approximately 1903, this distinction drops away, and icons provide him with the means of explicating the interpretability of terms. This is because resemblance underpins the generality of predicate terms, and hence, the truth, falsity, or corrigibility, of particular propositions.

Icons are exemplified variously: by samples and examples, by pictures, by maps, by diagrams, including tabular displays of the relations of classes (CP 2.278–82, 1903). The token is a sign of its type on the same basis (EPII: 287,

1903). Peirce consistently specifies that its syntax, and its syntax alone, fits an icon to be a sign.

... [an] Icon is a Sign whose significant virtue is due simply to its Quality ... (CP 2.92; 1902).

An *Icon* is a sign which refers to the Object that it denotes merely by virtue of characters of its own, and which it possesses, just the same, whether any such Object actually exists or not. (CP 2.247, 1903).

... a quality that it has *qua thing* renders [an icon] fit to be a representamen. (CP 2.276, 1903).

... [the] Object [of an Icon] is whatever there may be which is like the Icon ... (CP 2.314, 1903).

We should note the difference between the definitions of the icon from the second period and those of the third. The earlier definitions tell us that icons resemble their objects; the later ones reverse the relation, telling us that the object is “whatever there may be which is like the icon”. We might say that now, the icon *projects* a possible object.

It is this reversal that allows the icon to take an even greater role in Peirce’s philosophy as he seeks to place abduction at the centre of his account of pragmat(ic)ism. Iconicity is the formal construal of imaginary states of affairs, and thus of hypothesis (cf. CP 5.189; CP 5.196; CP 5.567 etc.), the premiss of which “is determined by the conventions of language, and expresses the occasion upon which a word is to be used” (CP 5.291). The difference between hypothesis and fiction is just that the former can be submitted to experimental testing, while the latter cannot. But Peirce expresses the same hesitation over the semiotic status of icons as he does over that of the objects of fiction:

It is true that unless there really is such an Object, the Icon does not act as a sign, but this has nothing to do with its character as a sign. (CP 2.247, 1903).

(d) The last period

Now Peirce raises a new question: what are the fundamental conditions for some thing to act as a sign? This is the question of the replica, later named the *sinsign*, and later again, the *token*. There must be a law governing its form (the *legisign* or *type*), and for which implementation on occasion (the *token*) is a pragmatic requirement (the *token*); further, the law governs qualities that guarantee its perceptibility (the *qualisign* or *tone*) (CP 2.243–246; 1903; CP 2.292; 1903). This new trichotomy recasts the whole theory of signs on a foundation that has been more or less implicit to date, but that is now explicit and

hence accessible to investigation. This foundation is what European semiotics would call the signifier²: “one of these days, he writes, philologists may take it in hand, for which logicians will thank them“ (EPII: 19, 1895). It may be “trivial” as he sometimes writes, but this is because it forms part of the trivium (cf. EPII: 19n, 1895), and is the propedeutic to logic proper (CP 2.83, 1902).

To all intents and purposes, the status of the signifier in Peirce’s semiotic is the subject of the present reflections. I take this to be closely tied to the scope of Speculative Grammar.

The Scope of Speculative Grammar

In the “Syllabus”, it is asserted that the syntax “is a *fact* concerning the Dicsign considered as a First, that is, in itself, irrespective of its being a sign” (EPII: 282, 1903). These qualities are “part of” the sign’s meaning to the extent that understanding how they function is a condition for understanding how the sign is fit to be a sign. While Peirce differentiates between the syntax of the logician and that of the philologist, allocating to the former the abstracted propositional form, and to the latter the full range of “different forms of expression” (EPII: 18, 1895), he nonetheless takes into account that it is the “accidents of history” that cause “a symbol to signify just the characters it does” (EPII: 317, 1904).

We might expect therefore that it would fall to Speculative Grammar, as distinct from the other divisions of semiotic, to study the syntax of signs, and further, that this study would be represented in practice in Peirce’s writings concerning the classifications of signs; there are some indications that it does so. But this never becomes an established position, and the scope of Speculative Grammar remains unstable. In the “New List”, the first branch of the new science of symbols “would treat of the formal conditions of symbols having meaning, that is of the reference of symbols in general to their grounds or imputed characters” (W2: 57, 1867). This excludes from Speculative Grammar anything but the “ground”, or the characters imputed to the object by the predicate of a proposition, and it also excludes the properties of icons and indices. The resulting restriction contrasts markedly with the scope of Speculative

² I use the term “signifier” in the sense established by Roland Barthes in “Le mythe aujourd’hui” (Barthes 1957). In this sense, the signifier comprises both the formal unit (grammatical, phonological) and the lexico-semantic value it has acquired through the history of its uses. It is this sense of “signifier” that is at work in Derridean deconstruction, where the play of the signifier is enabled by the connotative range of the unit and the paradigmatic associations of its cognates (for this latter, see Saussure (1983), Part II, chapter V).

Grammar as given in the “Syllabus”: it is “the general theory of the nature and meaning of signs, whether they be icons, indices or symbols” (CPI: 191, 1903). Even including the developments evident in his “mature semiotic” (Short 2007: 27; cf. also Freadman 2004) this instability persists. For example, in 1895, this branch “should study *modes of signifying*, in general” (EPII: 19) (this follows a heterogeneous list of what might count, or act, as a sign), while in 1908, Peirce returns to, indeed quotes, his view of 1867 (EPII: 482). Indeed, as late as 1911, we read that Speculative Grammar is restricted to the study of propositions and assertions (CPII: 206), whereas in 1909 he had written to William James that “Book I” of his proposed work in logic will “treat . . . of the essential nature of a Sign, and of the main classes of *possible* Signs” and that it “must classify signs according first to their natures in themselves, second in relation to their Objects, and third in their relation to their *Interpretants*” (EPII: 500, 1909).

On the one hand, Speculative Grammar extends to the full range of signs; on the other, it is restricted to just those signs of interest to “logical critic”. The explanation for thus restricting its scope may be the influence of Duns Scotus, to whom Peirce attributes the foundation of the field (eg. CP 2.83) but it may also be associated with the divergence between the two purposes for which Peirce developed his semiotic (Freadman 2004). In the algebraic logic, he used the three classes to describe the syntax of the notation. In this environment, a proposition is a mere variable designated by a letter, but when Peirce was preoccupied with elaborating his pragmat(ic)ism, the nature of the proposition itself returned to centre stage; there, the index and the icon are used to explicate the structure and presuppositions of predication, and it is this issue that dominates the restricted scope of Speculative Grammar. Nevertheless, it is also in response to the desiderata of pragmat(ic)ism that Peirce develops the first trichotomy (see above) to explicate the conditions of the action of signs. These conditions are its syntax taken broadly.

Supposing that we read this instability as contingent upon the discursive environment in which one or the other position emerges, then I think we must also read the final period as the one in which Peirce gathers together all his observations in an attempt to write a general theory of signs (Freadman 2004: esp. ch. 5). Then the broader account prevails, and the place of “syntax” in the theory is established.

Implications

Nevertheless, we are left with a paradox. Peirce maintains that the sign in itself is a sign, irrespective of its being a sign. We can understand this by recalling

that the qualitative aspects of a sign are the firstness of a third, they are not pure firsts. They can be apprehended by applying the rule of prescission, used by Peirce to distinguish the categories in the “New List”. But this does not solve the paradox; it merely restates it.

Vincent Colapietro makes some helpful distinctions that go some way to finding a solution to the paradox (Colapietro 1989). His concern is with signs that appear not to have real objects; he solves the problem by invoking the distinction between the immediate and the dynamic objects: “Although the sign determines its immediate object, the dynamic object determines its sign” (Colapietro 1989: 15). Problematic cases such as commands, grammatical connectives, and musical airs “could eventually be constrained by something outside themselves” (ibid.: 16). However, his concern is not with the nature of the first correlate; it is with the function of semiosis: “the world of our experience is always already constituted as a realm of signs” (ibid.: 21): “anything whatever is an invitation for interpretation” (ibid.).

Nevertheless, Colapietro does indicate the place in which we may seek a solution. If “nothing is inherently a sign”, then “we initiate . . . semiosis by taking up some stance toward a complex” (Colapietro 1989: 21). Compare Short, also arguing that the interpretant constitutes the relation of sign and object (Short 2007: 168): “As words are signs, anything we can speak of is the object of one or another sign, including things and events, individuals and their properties, classes and types, signs . . .” (Short 2007: 162–3).

It follows that the complex towards which we adopt an interpretive stance may itself be a sign – not its object, but its self. Peirce *dixit*: “. . . the sign not only determines the interpretant to represent . . . the *object*, but also determines the interpretant to represent the sign”. (EPII: 477–78, 1906)

Taking some thing to be a sign means providing a commentary on its syntax – its rules, its constitution –, on the kind of sign it is, and on the ground of its claim to represent something else. Whether we do so explicitly, as in European semiotics, or implicitly, in a philosophy of representation whose main concern is “critic”, is all one. Otherwise, utterance (Colapietro 1989: 22ff.) would be reduced to the shaking of rattles, and interpretation arrested in perpetual perplexity.

Catherine Legg¹

42 Logic, Ethics and the Ethics of Logic

... the main reason logic is unsettled is that thirteen different opinions are current as to the true aim of the science. Now this is not a logical difficulty, but an ethical difficulty; for ethics is the science of aims. Secondly, it is true that ethics has been, and always must be, a theatre of discussion for the reason that its study consists in the gradual development of a distinct recognition of a satisfactory aim. It is a science of subtleties, no doubt; but it is not logic, but the development of the ideal, which really creates and resolves the problems of ethics. (MS 431 with corrections from MS 429, 1902).

Peirce wrote this in 1902 as part of his “Minute Logic”, a major book project from his later, officially unemployed, years. The editors of EPII note that the book was so named “to reflect the minute thoroughness with which [Peirce] planned to examine every relevant problem” (xiv), and that within a year it ran to hundreds of pages. This vast project gave Peirce the opportunity to think in intricate detail about the architectonic structure of his thought. This groundwork bore much fruit: notably in Peirce’s 1902 grant application to the Carnegie Institution, still one of the best guides to the way Peirce’s mature thought would have unfolded had he been given access to resources commensurate with his abilities, and the 1903 Harvard lectures on pragmatism where (despite struggles with James over scope and purpose) he managed to distil into seven evening lectures a new philosophical system of brilliance and power, with many outlines previously unknown in the history of philosophy.

This remarkable quote encapsulates an enormous amount of Peirce’s philosophy, and offers a challenge to contemporary mainstream philosophy with respect to the codifiability of its subject matter on a number of levels, of which I will here discuss three: Peirce’s views on *pragmatism*, *ethics* and *logic*. The last two are particularly worth discussing in this context as a new relationship between ethics and logic was first worked out properly by Peirce around this time. Thus in the “Minute Logic” he writes that he has only recently come to realize that logic is only the third of the normative sciences, being “preceded by Esthetics and Ethics” (CP 2.197). He also notes that his understanding of the nature of ethics has shifted – although for many years he “doubted very much whether it was anything more than a practical science”, he is now beginning to understand the purpose of ethical *theory*, and to place it in “all the intimacy of its relation with Logic” (CP 2.198). (The next year, in his 5th Harvard lecture he

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states firmly, “Normative science is not a skill, nor is it an investigation conducted with a view to the production of skill” (CP 5.125)). He also clarifies that the scientific purpose of Ethics is not pronouncing things to be right and wrong, but understanding what rightness and wrongness *are*:

We are too apt to define ethics to ourselves as the science of right and wrong. That cannot be correct, for the reason that right and wrong are ethical conceptions which it is the business of that science to develop and to justify. A science cannot have for its fundamental problem to distribute objects among categories of its own creation. (CP 2.198).

Thus, for example, to define physics as, say, ‘the science which measures gravitational forces’ would foreclose on physicists being able to develop new and more sophisticated conceptions of that subject matter, and it would also not mean a great deal without a theory of what gravitational forces *consist in*, which can only be given within physics.

As is well known, Peirce’s final architectonic descended as follows: mathematics, phenomenology, aesthetics, ethics, logic, and on to the special sciences, starting with metaphysics, with each level drawing ‘principles’ from above and ‘data’ from below. At the same time pragmatism unites all levels by clarifying in general what it is for a sign to mean something. In each of our three philosophical areas: pragmatism, ethics and logic, as noted, our quote raises a certain basic issue concerning the ‘codifiability of knowledge’. Can all knowledge be placed in propositional form and stated explicitly? In recent times this issue has also been broached under headings such as “representationalism” (see for instance (Brandom 2011)), and “knowledge how vs. knowledge that” (Williamson and Stanley 2001). We will see how in all three philosophical areas Peirce is able to resist commitment to a simplistic codifiability via his exceptionally rich and nuanced account of the functioning of signs.

i) Pragmatism. In the quote Peirce distinguishes between ‘logic’ and the development of an ideal. Much subtlety in Peirce’s account of signification derives from its stipulation that meaningful signs are so by virtue not just of an *object* – an entity to which they refer – but also an *interpretant* – a *usage* of that sign by a community in negotiating the world. Signs must affect our practice in order to signify anything at all, and in his choice to keep the interpretant independent of and irreducible to the object, Peirce signals that the usage of our signs in principle outruns that to which they may be said to refer in any given case and at any given time. Peirce does in places suggest that at some far future point interpretant and object will “crystallise” in the *summum bonum*, but notes that even if one were to reach that ideal terminus, all thought would there cease (CP 6.33).

Thus in a 1908 letter to Victoria Lady Welby, Peirce wrote, “I define a Sign as anything which is so determined by something else, called its Object, and so determines an effect upon a person, which effect I call its Interpretant, that the latter is thereby mediately determined by the former”. He immediately added, “My insertion of ‘upon a person’ is a sop to Cerberus, because I despair of making my own broader conception understood” (SS: 80–81). What is the true upshot (or ‘final interpretant’) of a sign within the context of pragmatism is a delicate matter to state strictly. Around 1902 Peirce was seeking to reemphasise this true upshot – from sign-users’ *practice*, to some degree back to their *referents* – as a corrective against then-current readings of pragmatism (e.g. from James and his students) which to his mind overemphasised the practical. Thus in his 1901 entry on ‘pragmatism’ in Baldwin’s *Dictionary of Philosophy and Psychology*, he wrote:

If it be admitted . . . that action wants an end, and that that end must be something of a general description, then the spirit of the maxim itself, which is that we must look to the upshot of our concepts in order to rightly apprehend them, would direct us towards something different from practical facts, namely to general ideas, as the true interpreters of our thought. (CP 5.3).

In 1905 in “What Pragmatism Is”, he spoke even more strongly on the matter:

. . . if pragmatism really made Doing to be the Be-all and the End-all of life, that would be its death. For to say that we live for the mere sake of action, as action, regardless of the thought it carries out, would be to say there is no such thing as rational purport. (CP 5.429).

ii) Ethics. We noted above that Peirce draws a distinction between logic and “the development of the ideal”. In the same sentence he argues that only the latter “really creates and resolves the problems of ethics”. It might seem that here he is stating that practice rather than theory is paramount in working out the discipline of ethics. However the relationship between theory and practice in ethics is a notoriously thorny issue for Peirce. It is well-known that in the first of his 1898 Harvard lectures, “Philosophy and the Conduct of Life”, Peirce made strong claims apparently suggesting that ethical insight should spring from instinct alone, since our reasoning is too fallible to bear the weight of real-life ethical decision-making, giving the following somewhat searing example:

[the man] who would precipitately change his code of morals at the dictate of a philosophy of ethics – who would, let us say, hastily practice incest – is a man whom we should consider unwise. The regnant system of sexual rules is an instinctive or sentimental induction summarizing the experience of all our race. That it is abstractly and absolutely infallible we do not pretend; but that it is practically infallible for the individual . . . that we do maintain. (CP 1.633).

The overall moral of this lecture was to recommend sentimentalism over ‘rationalism’ in ethics, and to claim that ethical theory develops solely by “slow percolation” of rational ideas into instinct over the ages, rather than by conscious or explicit inquiry. However by 1902 Peirce seems to have softened on the desirability of conscious ethical theorising.

The codifiability of ethics is generally so taken for granted in contemporary mainstream philosophy that it is not thought even to need arguing for. Thus for instance *The Stanford Encyclopedia of Philosophy* defines the current ‘top two’ ethical theories as follows: “... deontology is one of those kinds of normative theories regarding which choices are morally required, forbidden, or permitted. In other words, deontology falls within the domain of moral theories that guide and assess our choices of what we ought to do ... And within that domain, deontologists ... stand in opposition to consequentialists”. (Alexander and Moore 2012, see also Walter Sinnott-Armstrong 2011). There is, however, a valiant rear-guard critique of codifiability from the field’s current ‘third party’: virtue ethics. Thus Rosalind Hursthouse (nicely) summarises the codifiability claim as follows:

... the task of ethical theory is “to come up with a code consisting of universal rules or principles ... which would have two significant features: (a) the rule(s) would amount to a decision procedure for determining what the right action was in any particular case; (b) the rule(s) would be stated in such terms that any non-virtuous person could understand and apply it (them) correctly. (Hursthouse 2012).

Hursthouse suggests that the problem with this is that any application of such a code purely on its own terms generally has awful results (as Peirce predicted in 1898), and that this in fact happened with the growth of professionalised applied ethics through the 1960s and 70s, where:

[m]ore and more utilitarians and deontologists found themselves agreed on their general rules but on opposite sides of the controversial moral issues in contemporary discussion. It came to be recognised that moral sensitivity, perception, imagination, and judgement informed by experience – phronesis in short – is needed to apply rules or principles correctly. (Hursthouse 2012).

However many consequentialists and deontologists – undaunted by this critique – currently dismiss virtue ethics for not being “action-guiding” (i.e. codifiable) (e.g. Das 2003), while other virtue ethicists endeavour to demonstrate that their view is action-guiding (van Zyl 2009; Swanton 2001).²

² It is also worth mentioning here that contemporary critique of ethical codifiability is also coming from moral particularists such as Jonathan Dancy.

Peirce's discussion of ethics places this debate in a broader context which arguably points the way towards resolution. Firstly, as already noted, Peirce suggests that ethics should not be understood as a discipline whose role is to (as the *Stanford Encyclopedia* put it) "assess and guide our choices" as right or wrong since (as we saw Peirce put it) "these concepts are not prior to the discipline of ethics but emerge from it". In other words, before making definitive pronouncements concerning *which* acts are good and bad one needs to answer the question of *what* goodness and badness are, and Peirce suggests that the latter question is so deep as to have been barely broached by philosophy to his day. (In this regard he notes, interestingly, that the normative character of Ethics, far from being provided by the practical application of Ethics, "may equally have its origin in the circumstance that the science which presents it is so very abstract, so alien to any experiential lineage, that ideals alone, in place of positive facts of experience, can be its proper objects" (CP 2.46). In Lecture 6, Peirce precisely offers consequentialism (or 'vulgar utilitarianism') as an example of the problems caused by rushing to answer the former question at the expense of the latter. He claims that such utilitarianism is unable to explain *why* its pronouncements concerning right and wrong should be considered true:

... [the utilitarian's] fault does not lie in his pressing too much the question of what would be the good of this or that. On the contrary, his fault is that he never presses the question half far enough, or rather he never really raises the question at all. He simply rests in his present desires as if desire were beyond all dialectic. He wants, perhaps, to go to heaven. But he forgets to ask what would be the good of his going to heaven. He would be happy there, he thinks. But that is a mere word. It is no real answer to the question. (CP 5.158).

Secondly, Peirce's pragmatism shows how codifiable theory and uncodifiable practice can work together *over time*, serving as different faces of the same semiotic coin, since "our logically controlled thoughts compose a small part of the mind, the mere blossom of a vast complexus which we may call the instinctive mind" (CP 5.212). Thus, the never-fully-codifiable acting of individuals in situations which lead to open-ended sets of experiences and feelings gives ethical concepts meaning and a spur to future development in ethical inquiry. Meanwhile, however, the codification of ethical theory greatly strengthens and organises that inquiry. Rather than opposing positions of 'representationalism' and 'anti-representationalism', then, we have necessary complements in an integrated process which we must hope (like the whist-player who does not *know* that player card distribution allows tricks to be saved, but must *hope* that it does in order to have any chance of winning (CP 2.113)) over the long-run arcs towards truth. This temporal-evolutionary dimension to theorising which is opened up

by Peirce's theory of truth is a strength today arguably largely unappreciated outside of Peirce scholarship.

iii) Logic. In the opening paragraphs of the "Minute Logic", Peirce announces that logic is "the theory of the conditions which determine reasonings to be secure" (CP 2.1). This reveals an understanding of the discipline considerably broader than that generally found today. In particular, it does not just embrace formal logic, but also philosophy of science, epistemology, and theory of cognition. As Moore helpfully summarises the matter in its relationship to ethics, "logic is concerned with the criticism of a certain kind of conduct (namely reasoning)" (Moore 2010: 23).

In the "Minute Logic" Peirce not only places the discipline of logic within a wider architectonic but also sets out a systematic account of its different branches, and clarifies its purpose. The "thirteen different opinions . . . as to the true aim of the science" cited in the quote are no mere figure of speech. In the section published in CP 2.18–78 (entitled there "Different Methods in Logic") Peirce considers in turn the desirability of basing logical principles upon: i) a certain logical 'feeling', ii) an individual experience, iii) the inner light of reason, iv) metaphysics, v) the results of scientific psychology, vi) the data of psychology, vii) a basic science underlying all sciences, which the Germans call *Wissenschaftslehre*, and to which nowadays the term 'epistemology' arguably at least approaches, viii) a kind of ordinary language philosophy which studies grammatical structures, ix) what will tend towards the stability of society, x) church authority, xi) the history of science, xii) everyday experience, and finally, xiii) the same source as mathematical truth, which ". . . is derived from observation of creations of our own visual imagination, which we may set down on paper in form of diagrams".

Peirce sees the thirteenth answer as the right one, and he goes on to chart the stages he sees as required to develop it. First he outlines his philosophical categories, here termed 'originality', 'obsistence' and 'transuasion'. These are used to derive, respectively, the concepts of sign, object and interpretant, then the trichotomous distinction between kinds of sign: icon, index and symbol. Following this, Peirce draws a further functional distinction between sign-types: term, proposition and argument. Having derived the concept of an argument, he distinguishes the three argument forms: abduction, deduction, induction, and argues that there are only three. The question of the validity of induction leads to probability theory, which leads on to the logic of the natural sciences. In the 1903 Harvard lectures this outline is considerably more compressed and Peirce bemoans the fact that he can offer no real arguments, but merely state some of

the chief conclusions to which he has been led. However the same essential stages are visible, although he also emphasises the founding of logic in a direct perception of Thirdness which blurs the line between structured inference and felt “continuous process” (CP 5.181) in the way that a set of drawn circles can be seen *as* a stone wall and then as a mere set of drawn circles again, and there is no clear division between the two seeings, which he was newly struck by.

In this mature Peircean program for the development of logic at least two ethical dimensions are worth noting. Firstly, it follows from the role of the ever-evolving interpretant in sign-development that logic is essentially a social enterprise directed at a future goal that no-one can enjoy individually. But Peirce was saying this sort of thing from the start of his career (e.g. in “The Fixation of Belief”). What is arguably new in this 1902–3 period is an emphasis on the fact that logic rests on a dyadic distinction between truth and falsity, and that this is a special case of the dyadic distinction between rightness and wrongness found in ethics. Moreover, the key to keeping the two poles separate – in ethical behaviour, and thus also in logic – is *self-control*. These insights are worked out in Peirce’s criticisms of Dewey’s volume *Studies in Logical Theory*, in a letter written in 1905, where he writes, “I find the whole volume penetrated with this spirit of intellectual licentiousness, that does not see that anything is so very false . . .”, and:

Chicago hasn’t the reputation of being a moral place; but I should think that the effect of living there . . . would be to make you feel all the more the necessity for Dyadic distinctions, – Right and Wrong, Truth and Falsity. These are only to be kept up by self control. Now just as Moral Conduct is Self-controlled conduct so Logical Thought is Moral, or Self-controlled, thought. (CP 8.240–1).

iv) The development of the ideal. Bringing together these considerations concerning ethics and logic, we now consider the nature of the development of the (logical) ideal. What would such an enterprise actually consist in? We can now see that it must consist in a community of inquiry not merely theorizing about or codifying its aim of truth, but actively *practicing* the pursuit of it, communally, exercising self-control to avoid spending the community of inquiry’s resources on activities that are not conducive to that pursuit. Insofar as such practices succeed they will embody (if only in some small way) the growth of *concrete* reasonableness which Peirce identified in his later work as the *summum bonum* incarnate.

Given that, one might speculate in a critical vein on current institutional arrangements in academia. There has arguably been a significant shift in recent years to exert pressure on professional inquirers to spend as much of their work life as possible producing ‘research outputs’ (including, even, research outputs

about truth), to the extent that many academics now lack the time to perform other community-building but output-free (uncodified) activities, such as reading others' work, and training and supporting the young. Insofar as this is the case, from a Peircean perspective this 'logical ideal' may be seen as unethical. What would it mean if we really loved the logic in each other?

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Rosa Maria Mayorga¹

43 Beauty and the Best

That science [Esthetics] has been handicapped by the definition of it as the theory of beauty.
(CP 2.199, 1902).

As happens frequently when reading Peirce, his most enigmatic remarks turn out to be, upon closer examination, quite understandable in light of his broader views, and therefore not as “bizarre” (as one commentator calls it²) as they originally seemed. A case in point is his observation on the nature of beauty and esthetics, two notions commonly considered to be intrinsically related. Peirce denies that this is so, indeed he argues vehemently against using the conception of beauty to attempt to explain what it is “that esthetics seeks to make clear” (CP 2.199), claiming that the notion of “reasonableness”, is best.³ I argue that Peirce’s position against beauty as the foundation for esthetics can be understood best in light of his critique of nominalism.

Peirce’s rejection of nominalism in the metaphysical sphere is well known; unlike metaphysical nominalism, “whose doctrine is that reality and existence are coextensive, that “real” and “existent” have the same meaning”, Peirce’s metaphysical realism recognizes the category of Thirdness as real, yet not existent (CP 5.503).⁴ Hence, Peirce can claim that laws, relations, and concepts, are real and can therefore explain the predictive success of science and render the quest for necessary connections among phenomena intelligible. Nominalism, on the other hand, recognizes individuals (Seconds) as the only category, and therefore fails to recognize Thirdness, thereby blocking the “the road to inquiry” (CP 1.170). But nominalism, as Peirce uses the term, is not confined to metaphysics; any theory that emphasizes the importance of the individual, according to him, is nominalistic and therefore flawed. Cartesianism, for example, is

¹ Miami Dade College, USA.

² See Beverly Kent 1979. “Peirce’s Esthetics: A New Look”, *Transactions of the Charles S. Peirce Society* 12(3). 267.

³ “The one thing whose admirableness is not due to an ulterior reason is Reason itself comprehended in all its fullness, so far as we can comprehend it. Under this conception, the ideal of conduct will be to execute our little function in the operation of the creation by giving a hand toward rendering the world more reasonable whenever, as the slang is, it is “up to us” to do so” (CP 1.615). Sometimes Peirce adds the adjective “concrete” – “And the highest of all possible aims is to further concrete reasonableness” (CP 2.34).

⁴ See my book: *From Realism to Realicism: The Metaphysics of Charles Sanders Peirce*. Lanham: Lexington Books/Rowman and Littlefield Publishers Inc., 2007.

nominalistic from an epistemological standpoint since the ultimate guarantor of knowledge is the individual (that is, the individual's "clear and distinct ideas"). Peirce's emphasis on the final opinion of the community of inquirers as the ultimate guarantee of knowledge attempts to correct this nominalist mistake. Indeed Peirce claims that "all modern philosophy of every sect has been nominalistic", and practically no one escapes Peirce's criticism – Descartes, Locke, Berkeley, Hume, Mill, Kant, and Hegel, at one point or another are labeled nominalists (CP 1.19).

In a recent paper,⁵ I argue that Peirce's concern to shift the focus from the individual (it is the individual who is the source of error for Peirce) to the community can also be seen in a normative context:

The question whether the genus homo has any existence except as individuals is the question whether there is anything of any more dignity, worth, and importance than individual happiness, individual aspirations, and individual life . . . Whether men really have anything in common, so that the community is to be considered as an end in itself . . . (W2: 487).

Nominalism (individualism) as here understood gives value only to selfish concerns – one's own happiness, one's own life. For Peirce, this again is a mistake; it fails to acknowledge the value of the community, the value and worth of humankind itself (for Peirce, a Third).

In a similar way, I argue that Peirce's comments regarding beauty and esthetics can also be traced to his refutation of nominalism:

So, then, we appeal to the esthete to tell us what it is that is admirable without any reason for being admirable beyond its inherent character. Why, that, he replies, is the beautiful. Yes, we urge, such is the name that you give to it, but what is it? What is this character? If he replies that it consists in a certain quality of feeling, a certain bliss, I for one decline altogether to accept the answer as sufficient. I should say to him, My dear Sir, if you can prove to me that this quality of feeling that you speak of does, as a fact, attach to what you call the beautiful, or that which would be admirable without any reason for being so, I am willing enough to believe you; but I cannot without strenuous proof admit that any particular quality of feeling is admirable without a reason. For it is too revolting to be believed unless one is forced to believe it. (CP 1.612).

Recall that one tradition in esthetics focuses on the effect that beauty has on the beholder, ranging from pleasure, desire, admiration, love, or delight.⁶ Peirce

⁵ See Mayorga, Rosa. 2012. Peirce's Moral "Realism". In Cornelis De Waal and Chris Skowronski (eds.), *The Normative Philosophy of Charles S. Peirce*, 101–124. New York: Fordham University Press.

⁶ Sartwell, Crispin. 2012. Beauty. In Edward N. Zalta (ed.), *The Stanford Encyclopedia of Philosophy*. <http://plato.stanford.edu/entries/beauty/> (11 December, 2013).

finds “revolting” the claim that an ultimate end or ideal could be reduced ultimately to pleasure – “a certain bliss” that for Peirce amounts to “hedonism, which no man in his senses, and not blinded by theory or something worse, can admit” (CP 5.110). To say that the summum bonum, or ultimate ideal is reduced to an individual’s particular sensation, that of pleasure, is a grave nominalistic error, for, as he says elsewhere:

Individual action is a means and not our end. Individual pleasure is not our end; we are all putting our shoulders to the wheel for an end that none of us can catch more than a glimpse at . . . that which the generations are working out. But we can see that the development of embodied ideas is what it will consist in. (CP 5.402).

On the other hand, the “development of embodied ideas”, or “reasonableness”, as the summum bonum, reflects Thirdness, and is therefore more in tune with realism, the position Peirce endorsed throughout his career.

Peirce’s aversion to nominalism can also explain his initial reticence to consider seriously a science of esthetics, as can be seen below where he describes the sequence of his realization of the connection between ethics, logic, and aesthetics:

This last objection [that the Good and Bad originate in Esthetic Feeling] deceived me for many years. . . . I was led by this objection to a line of thought which brought me to regard ethics as a mere art, or applied science, and not a pure normative science at all . . . But I did not remain of this opinion long. I soon came to see that this whole objection rests upon a fundamental misconception. To say that morality, in the last resort, comes to an esthetic judgment is not hedonism – but is directly opposed to hedonism. (CP 5.111).

Peirce saw that if ethics (with its attendant notions of Good and Bad) on which logic was based, was in turn dependent on what amounts to mere individual (subjective) feelings (esthetics), in other words, a nominalistic foundation, the relationship would be based on a false theory. The solution was to see if esthetics could be found to have a non-nominalistic basis, that is, a realistic foundation, which is what I think Peirce tried, in several ways, to do.

Once Peirce was open to the consideration that the normative sciences of esthetics, ethics, and logic were interconnected, were theoretical sciences (and not just applied sciences), and hence were worthy of philosophical study, he could proceed to argue the point of what the ultimate end or ideal was (or ought to be). Unlike many estheticians before him, he did not think that the notion of beauty defined the summum bonum in esthetics, but thought rather that his notion of concrete reasonableness captures it best.

Joao Queiroz¹ & Pedro Atã²

44 Iconicity in Peircean situated cognitive Semiotics

A psychologist cuts out a lobe of my brain . . . and then, when I find I cannot express myself, he says, 'You see your faculty of language was localized in that lobe.' No doubt it was; and so, if he had filched my inkstand, I should not have been able to continue my discussion until I had got another. Yea, the very thoughts would not come to me. So my faculty of discussion is equally localized in my inkstand. It is localization in a sense in which a thing may be in two places at once. (CP 7.366, 1902).

Although only recently a more systematic discussion upon the distributed nature of the mental processes have been established in empirical fields, the philosophical basis of this thesis and its variations have well-known precursors. Among them, the most quoted are William James, Wittgenstein, Dewey, James Gibson, Vigotsky, Merleau-Ponty, Heidegger (see Gallagher 2009, Kirsh 2009, Wheeler 2005). However, Charles Sanders Peirce, the least mentioned among the pragmatists in this context, can be considered an *avant-garde* situated and embodied cognition proposer. In fact, Peirce should be considered an important precursor of situated mind and distributed cognition thesis. But differently from the anti-cartesianism defended by some embodied-situated cognitive science, which is predominantly anti-representationalist, as recently explored in a Merleau-Pontyan (Dreyfus 2002), Heideggerian (Wheeler 2005), or a Gibsonian (Chemero 2009) trend, for Peirce, mind is semiosis in a dialogical – hence communicational – materially embodied form, and cognition is the development of available semiotic artifacts in which it is embodied as a power to produce interpretants. It takes the form of development of semiotic artifacts, such as writing tools, instruments of observation, notational systems, languages, and so forth, as stressed by Skagestad (2004) and Ransdell (2003) with respect to the concept of intelligence augmentation. For Kirsh (2009: 297), “Peirce first mentioned this idea – that people use external objects to think with – in the late nineteenth century, when he said that chemist think as much with their test tubes as with pen and paper”.

The core of Peirce’s arguments combines two theses: the mind is a kind of semiosis; sign processes are extended within the spatiotemporal dimension, so

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that something physical has to instantiate or realize them. According to the first one, the mind is the nature of the sign-action (CP 5.313–14). The second thesis asserts that signs cannot act unless they are spatiotemporally realized. Thus, if a sign is to have any active mode of being, it must be materially embodied (or, at least, it results from a previous operation with material signs). The consequences of this combination leads us directly to the ideas on distributed cognition. The basic idea of distribution cognition thesis is that humans can alter the space for better organization of thought, by building artifacts that scaffold cognitive processes and increase and/or modify problem-solving activities, by simplifying choice, perception or internal computation and leading to the reduction of environment complexity (see Clark 1998 & Kirsh 1995). Cognitive artifacts are tools that work as prostheses capable of extending human capacities, creating new abilities and changing the way we structure and solve problems. More radically, it can be said that such mind-tools not only help thinking but rather that the mental activity itself is embedded in them. Mental activity takes place outside the head in a space designed and built to think (Sterelny 2003).

Peirce's insights on the relevance of external semiotic processes in different forms of reasoning are interwoven in his cognitive semiotics. Semiosis exhibits a rich variety of morphological patterns. The morphological space of semiotic processes in which cognitive systems are embedded include proto-symbols (quasi-symbolic structures) and variations of indexical signs, besides symbolic and iconic processes (images, diagrams, metaphors). The icon is an important component in his semiotic view of mind, because it embeds a kind of signification especially dependent on the material of which the sign is made. We know little, however, about 'how' semiotic resources, their typological variations and their specific properties, are capable of changing or influencing cognitive performance, or how certain physical properties *constrain* different forms of inferences, e.g., abductive inference. According to Paavola (2011), in abduction the iconic character of reasoning is more prominent, which renders plausible that in this kind of inference external aspects are especially relevant. Magnani (2005), with focus in this particular property, has developed the concept of "manipulative abduction" to refer to those cases where the inference depends on the exploration of external resources – it "happens when we are thinking *through* doing and not only, in a pragmatic sense, about doing" (Magnani 2005: 274). It is described as concrete manipulative reasoning, an extra-theoretical behavior that implies the application of strategies related to extra-rational (emotional, esthetical, ethical, economic) components. (Magnani 2005: 274).

Peirce's fundamental typology of signs exhibits a property capable of functioning as a conceptual criterion to distinguish different kinds of signs: the rela-

tive dependence of sign-object-interpretant (S-O-I) components in triadic relation (S-O-I) (see Queiroz 2012). A symbol is an S-O relationship logically dependent on I (CP 2.307). In a different way, an index is dependent on O. Constraints resulting from the space-time existence of the object represented by the index are irrelevant in symbolic processes. Icons, in turn, are deeply dependent on the material, form and structure of which they are made – “An Icon is a sign which refers to the Object that it denotes merely by virtue of characters of its own, and which it possesses, just the same, whether any such Object actually exists or not” (CP 2.247). According to this basic criterion, the icon is the only type of sign which is S-dependent (that means, dependent on the sign material and structural organization itself) and is able to reveal, through its manipulation, some information about the object. This operational property of iconicity is considered a detrivilization of the notion that the icon is fundamentally based on a relation of similarity (see Stjernfelt 2011), with important implications here. According to Hookway (2002: 102), “The key of iconicity is not perceived resemblance between the sign and what it signifies but rather the possibility of making new discoveries about the object of a sign through observing features of the sign itself”. If the notion of iconicity attests the capacity of material features to be the semiotic basis of important cognitive operations, and not only play a secondary role, then it is a strong candidate to clarify situatedness and distributedness of reasoning as a matter of manipulation of external resources.

Zhang & Norman are two of the scientists whose investigations have been helping in the comprehension of external representational processes and problem-solving tasks. As we try to demonstrate with the example of Zhang & Norman’s (1994) experiments with the Tower of Hanoi game, the icon is a main character involved in the process of externalization of constraints. The way the artifacts operate, in problem solving, creates a space of action which is dependent on the material (and structural organization) of which the manipulated sign is made. Zhang & Norman have used the tower of Hanoi game to study the influence of external representations in cognition. More specifically, they were dealing with the Representational Effect: difference in cognitive behavior caused solely by external representational features. The Representational Effect is investigated through the comparison of performance upon isomorphic representations in problem solving tasks. We claim that the authors’ experiment investigating the level of isomorphism of rule representations (Zhang & Norman 1994: 20–23) function as an example of externalized problem-solving based on iconicity.

There were three rules in the game for this experiment (see table 1) and two ways in which these rules could be introduced in play: internally (given as a list of instruction read before the experiment and memorized by the players) or

externally (automatically embedded in the material of play). Three isomorphs of the game were designed (see figure 1), which represented either internally or externally each of the rules. The experiment measured the time required for solution, the number of steps required for solution and the number of wrong moves for each of the three isomorphs. In the three cases, the results for the most internalized version were the worst: more time to solve, more number of steps required to solve and more wrong moves. For the most externalized version, the results were the best: less time to solve, less number of steps required and almost no wrong moves (see figure 2). This experiment, together with others in the same article, have led the authors to propose that more externalized representations are also more efficient representations for problem solving (see also Zhang 1997; Chuah, Zhang & Johnson 2000).

Table 1: The three rules of the Tower of Hanoi experiment. The rules could be introduced either externally (E) or internally (I), generating the isomorphs I123, I12-E3, I1-E23.

-
1. Only one piece can be transferred at a time
 2. A piece can only be transferred to a place on which it will be the largest
 3. Only the largest piece in a place can be transferred to another place
-

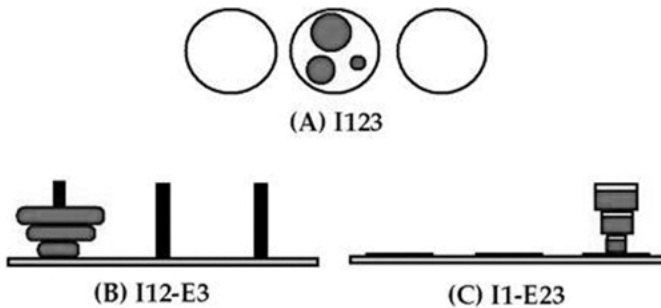


Figure 1: The three isomorphs used in Zhang & Norman's experiment. (A) uses balls of different sizes moved between plates, so that all rules are presented internally; (B) uses disks of different diameters stacked one on top of the other between poles, so that rule 3 is presented externally; (C) uses cups of different sizes filled with liquid stacked one on top of the other plates, so that rules 2 and 3 are presented externally.

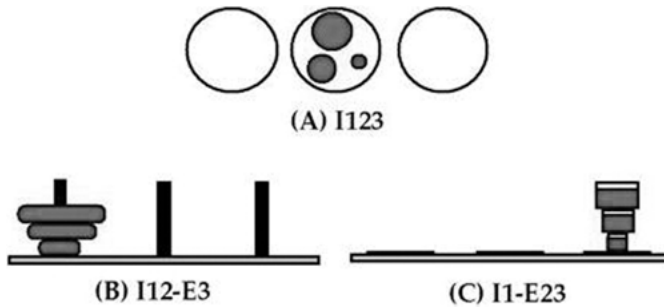


Figure 2: The time required to solve, the number of steps required to solve and the number of wrong moves made in which of the isomorphs. The more internalized version (I123) proved itself to be the most difficult version to play, and the more externalized (I1 E23) the easier.

The criterion the authors have used to classify between internal and external rules matches a criterion for iconicity, namely, dependence of material properties, or S-dependence. The different isomorphs of the experiment can be modeled as semiotic processes of communication of a form or habit from an object to an interpretant through the mediation of the sign.³ The object (O) of this triadic relation is the formal structure of the game that is common to all isomorphs. The sign (S) is the medium through which the game is played, i.e., the specific pieces and places and also the list of written instructions. The interpretant (I) is the constraining in behavior that characterizes the act of play itself. With this framework in mind, and taking into consideration the criterion of relative dependence of terms for the fundamental classification of signs, we conclude that, for the (i) internal and (ii) external cases:

- (i) O (formal structure of the game) is independent of S (material of play). If you change the materials used to play, the game remains the same. The S-O relation cannot be established by these two terms alone, it requires the mediation of a third term (I). The constraining upon the specific material of play, that makes it correspond to the formal structure of the game, only happen as a cognitive constraining in the behavior of the player, in the act of play itself. As S-O relation is dependent of I, this is an example of symbolic semiosis.
- (ii) The game is S-dependent. If you change the materials used to play, the formal structure of the game changes. The S-O relation is already established inde-

³ A sign can be defined as a medium for the communication to the interpretant of a form (habit) embodied in the object, so as to constrain, in general, the interpreter's behavior (EPII: 544, n.22; see Queiroz & El-Hani 2006).

pendently of the third term (I), because the constraints of S are a materialization of the formal structure of the game. The constraining upon the specific material of play, which makes it correspond to the formal structure of the game, is already given in the material of play before the game is played. As S-O is dependent of S, this is an example of iconic semiosis.

To say that a representation is external in respect to some constraints already implies that these constraints are S-dependent, and that we are dealing with iconic semiosis. Accordingly, the claim for the efficiency of externalization of constraints in problem solving is viewed here as a claim for the distribution of problem-solving cognitive abilities through iconic artifacts.

Conclusion: If mind is exosomatically embodied in signs ...

The acceptance of external signs as part of human cognition leads to different conceptions on the relation between cognition and environment that put much more emphasis on the active participation of the latter in shaping our minds. We actively participate in the construction of niches (semiotic structures and processes physically available in the environment), which fundamentally alter our capabilities (see Sterelny 2003; Sinha 2009; Bardone 2011). They make complex semiotic processes available to attention, consciousness, perception, opening a new range of semiotic operation; permitting, for instance, deep self-inspection of complex semiotic processes.

We have used the Tower of Hanoi game experiment to identify a mechanism through which iconicity influences in cognitive performance. Zhang & Norman's experiment indicated the process of externalization of constraints as a strategy to improve performance in problem-solving tasks. This process of externalization of constraints necessarily relies on the iconic character of signs because it makes signification dependent on the materiality of the sign itself. Under this framework, to distribute part of our tasks to external constraints in the 'outside world' is an example of iconic semiosis.

How the dynamics of cognition depend on the material properties of signs and the context of sign-action? The notion that we use external signs to think with is uncontentious when signs are typically symbolic (which can be described as borderline cases), such as maps and diagrams, algebraic notations, written systems, etc. But the morphological space of semiotic events and processes in which cognitive systems are embedded always include intermediary and mixed

classes of signs. The semiotic part of a theory of thinking with external resources should provide the formal and analytic tools for evaluating why certain things can function as signs that can be thought with. Peirce's semiotics offers a highly consistent framework to investigate the use of different kinds of signs in cognitive processes. Peirce's broad ideas concerning different types of signs and inferences are an important tool for advancing in the development of an externalist theory of mind. His treatment suggests that a reconsideration of the embodied-situated paradigm's own philosophical foundations can behave in semiotic terms. Peircean semiotic theory of mind neither restricts representations to symbolic semiosis and inferential processes to deduction and induction as in orthodox representationalism, nor rejects representations as in anti-representationalism.

Peter Skagestad¹

45 The Purloined Inkstand

A psychologist cuts out a lobe of my brain (*nihil animale me alienum puto*) and then, when I find I cannot express myself, he says, ‘You see, your faculty of language was localized in that lobe.’ No doubt it was; and so, if he had filched my inkstand, I should not have been able to continue my discussion until I had got another. Yea, the very thoughts would not come to me. So my faculty of discussion is equally localized in my inkstand. (CP 7.366, 1902).

My chosen quote is from the section ‘Classification of the Sciences’ in Peirce’s *Minute Logic*, dated 1902. We begin by noting Peirce’s idiosyncratic take on the Roman comedian Terence’s famous dictum: *Homo sum: humani nil a me alienum puto* – I am a human being: I consider nothing human to be alien to me. The question of exactly why Peirce considered this quote to be apposite to the subject at hand – the nature of psychology – must remain in abeyance; we shall simply raise the narrower question of why Peirce replaces Terence’s ‘humani’ with ‘animale’. That Peirce made a mistake in quoting Terence is hardly credible. And my conjectural answer is that Peirce wanted to subsume the faculty of language – then as now widely though not universally held to be the exclusive prerogative of humans – under the faculty of *semiosis*, i.e. the production, interpretation, and transformation of signs, a faculty evidently in the possession of other animals as well. The psychology of language, in other words, is part of *semiotics*, i.e. the general theory of signs. So, nothing animal is alien to Peirce, a sign user among other sign users, human or not.

Back to the wider quote in which the Terence misquotation is embedded; what exactly is Peirce doing here? He is of course making a joke, but Peirce rarely joked without having a serious point to make in the process. And the point he is making here appears at first glance to be to ridicule the notion, popular in the academic psychology of his day, that mental faculties are localized in particular parts of the human body. This reading is indeed reinforced by the very next sentence in Peirce’s manuscript: “It is localization in a sense in which a thing may be in two places at once” (ibid.). In other words, Peirce seems to be telling us, the localization of his faculty of discussion, be it in his frontal lobe or in his inkstand, is not localization at all.

Maybe. But notice what Peirce says about his inkstand-deprived condition; not only is he unable to communicate his thoughts, but “the very thoughts would not come to me”. Peirce is here reminding us of something familiar to us

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all: anyone who has ever done any serious writing has had the experience that, during the writing process, thoughts come to us that were certainly not in our consciousness when we sat down to write, thoughts which at least appear to have arisen as a result of the writing process. Similarly, anyone who has ever grappled with problems in logic or mathematics knows that any reasonably complex problem is not solved by thinking things through in one's head, but by doing things with pencil on paper and then observing what results appear in front of our eyes. (To take the simplest possible example, if you solve a syllogism using a Venn diagram, you do not diagram the conclusion, yet if the syllogism is valid the conclusion appears in the diagram – all by itself). These are examples of Peirce's insistence, early and late in life, that all thinking is in the form of signs, which are not themselves material objects but which depend on material substrata, or sign vehicles, of which ink marks on paper are an obvious example in the present context. So, my reading of the inkstand quote is that, while Peirce is indeed denying any literal localization of the faculty of speech, he is at the same time affirming an important relationship between his thoughts and his inkstand, a relationship that may be termed 'virtual' localization. While Peirce does not depend on this inkstand – or necessarily any *inkstand* specifically – for his thoughts, there are certain thoughts that will not come to him without *some* external sign vehicles and *some* external means – be they hands and pens or other means – for manipulating sign. The process of sign interpretation that in this view constitutes thinking does not take place in the brain, but in a semiotic field that includes the brain, the hands, and the eyes, as well as external implements.

This reading of the inkstand quote as epitomizing Peirce's famous doctrine of thought signs and its implicit semiotic model of the mind is supported by Peirce's insistence, in the same context, that "mind . . . is essentially an external phenomenon" (CP 7.364), that "it comes decidedly nearer the truth (though not really true) that language resides in the tongue [than in the brain]", and that "it is much more true that the thoughts of a living writer are in any printed copy of his book than that they are in his brain" (*ibid.*). I shall not on this brief occasion try to spell out in detail Peirce's semiotic model of the mind, but will refer the reader to Gérard Deledalle's magisterial work on the subject. I shall only note, with Deledalle (2000: 116–18), that while thinking, so understood, is a type of action, it is intensional and thus irreducibly triadic in nature – making something stand for something else in some respect – and so not explicable in behaviorist terms as attempted e.g. by Charles Morris.

I have argued in several papers over the past two decades that the model of the mind here set forth forms the counterpart of, and thus can serve as the theoretical framework for, the research program of intelligence augmentation

(IA), a program which contrasts with that of artificial intelligence (AI), although it has certainly also benefited from results of AI research. This is the research program that has brought us, in turn, time-sharing, interactive computing, personal computers, graphical user interfaces, and the internet. (Other obvious augmentation means such as word-processing and email are apparently better understood as by-products of the programming activity, rather than as the intended outcomes of any particular research program; I am indebted to Joseph Ransdell for pointing this out to me). The IA program has its roots in the nineteen-forties and fifties, in the seminal papers of Vannevar Bush and J.C.R. Licklider, it was spelled out in great detail by Douglas Engelbart in his 1962 report ‘Augmenting Human Intellect’ and was initially put into practice in the nineteen-sixties and seventies by Engelbart, by Ivan Sutherland, by Alan Kay, and others. Several of Engelbart’s assistants moved on to Xerox PARC, where a visiting Steve Jobs was allowed to survey the results of their work while planning the development of the Apple Macintosh. As noted by Howard Rheingold (1991: 25–26), the acronym IA was coined by the computer scientist Fred Brooks, who also first explicitly contrasted IA with AI.

None of these researchers, as far as I know, was in any way influenced, directly or indirectly, by Peirce, although I understand Engelbart has in recent years taken an interest in Peirce’s thought. But I never posited any Peircean *influence* on IA. The question that interested me was, what must the mind be like – how must it function – in order to be capable of being augmented through computer technology? And the answer plainly could not be that the mind is a computer, a view that remains popular in cognitive science. Peirce, I argued, supplied the IA program with the missing piece that the mind is essentially a sign user, whereas a computer from a Peircean perspective is both a sign vehicle and a tool for sign production and manipulation, essentially playing the roles of Peirce’s inkstand, pen, and paper.

The late philosopher and Peirce scholar Joseph Ransdell – to whom I shall always be indebted for intellectual stimulation, encouragement, and gentle criticism – has taken this line of thought a step further, by arguing that *interactivity* is the defining feature of computerized intelligence augmentation, as of Peirce’s conception of a community of inquirers. While affirming the Peircean dictum, quoted by me, “All thought is in signs” (CP 5.251), Ransdell emphasizes the dictum “All thought is dialogical” (CP 6.338), which he takes to be an implication of the former dictum. Consequently, Ransdell goes on to explore the capacity of computer networks for augmenting the collective intelligence of communities, using the physicist Paul Ginsparg’s arXiv system as an extended example. In this respect Ransdell’s line of inquiry parallels Engelbart’s decades-long preoccupation with “boosting collective IQ”, i.e. augmenting the intelligence

of work groups. I shall not pursue this subject on this occasion, but will simply recommend Ransdell's paper to all who are interested in Peirce's relevance for computerized intelligence augmentation.

In conclusion, Peirce's inkstand quip, as here interpreted, conveys a serious message: it epitomizes Peirce's semiotic model of the mind as essentially a sign user. And this model, in turn, promises to serve as a theoretical framework for understanding – and potentially advancing – the project of intelligence augmentation.

Frederik Stjernfelt¹

46 A Very Short Version of Diagrammatic Reasoning

The first things I found out were that all mathematical reasoning is diagrammatic and that all necessary reasoning is mathematical reasoning, no matter how simple it may be. By diagrammatic reasoning, I mean reasoning which constructs a diagram according to a precept expressed in general terms, performs experiments upon this diagram, notes their results, assures itself that similar experiments performed upon any diagram constructed according to the same precept would have the same results, and expresses this in general terms. This was a discovery of no little importance, showing, as it does, that all knowledge without exception comes from observation. (MS L75, Draft C: 91–92, 1902).

From one of the drafts of his Carnegie application, this is one of the most concentrated versions of Peirce's doctrine of diagrammatic reasoning. I took that doctrine as the centerpiece of my doctoral dissertation *Diagrammatology* (2007).

Here, I shall restrict myself to pointing out the revolutionizing potential in the doctrine which comes from the fact that it provides a completely new and groundbreaking carving up of the whole field of logic, mathematics, and semiotics. One seminal idea is the intimate connection between logic and observation, running counter to the prevailing idea that logic and intuition should be kept completely apart. The connecting link, of course, is the diagram. Logical and mathematical structures are taken to be accessed via diagrams – providing an original and fertile solution to the age-old problem of the epistemology of those fields (cf. e.g. Benacerraf's famous 1972 paper). What is observed is, immediately, diagram tokens iconically depicting logical or mathematical relations: drawings on paper, blackboards, computer screens, etc. Mediatly, however, such tokens provide the possibility of accessing diagram types – by focusing attention only upon few, relevant aspects of the diagram tokens and idealizing those aspects. By this procedure, the observation of general, ideal, patterns of logic of mathematics is possible. Along with this doctrine comes an enormous extension of the field of diagrams from their prototypical core of geometrical figurae. Algebras, maps, formalized languages, formal aspects of ordinary languages and much more now become subspecies of diagrams.

This has to do with the idea that diagrams not only make possible an observational access to ideal states-of-affairs – the tracing of logical consequences of those states-of-affairs is made possible, furthermore, by the manipulation of

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diagrams. Formal logical and mathematical proofs, solution of equations, proving of algebraical or geometrical theorems, implications drawn from propositions expressed in ordinary language, routes traced on maps, – all such explicit and implicit drawings of inferences are united under the headline of rule-bound experimentation with diagrams. When such rules are followed – in one direction or another, given the initial diagram – the implications follow with necessity. This gives another far-reaching corollary of the diagram doctrine: that diagrammatical reasoning is mathematical reasoning is necessary reasoning. How is necessary reasoning possible at all? For a fallibilist like Peirce, claiming all empirical knowledge is approximate and prone to some degree of error, you might expect necessary reasoning formed an impossible limit case only. Not so: the necessity of diagrammatical reasoning derives from the very fact that the diagram types accessed by diagram tokens highlight a few, controllable aspects of their object only. Unlike empirical objects with their indefinite amount of aspects, diagram types have a limited number of properties only – which is what makes it possible to control those properties completely. This implies a further corollary: the idea that formalization is possible in linear, “symbolic” representations only, is wrong. Formal control of diagrams of all sorts is possible – cf. Peirce’s Existential Graphs giving a formalized system of graphical representation of elementary logic.

This, in turn, gives another surprising corollary: that all necessary reasoning, also in the special sciences, is mathematical. That is, wherever necessary reasoning occurs, a mathematical structure lies behind. Mathematics ceases to be a special science, close to or even part of the natural sciences – mathematics rather becomes first science, turns up everywhere, only most often not identified as such because of the simplicity of the math used in most everyday reasoning. In the special sciences, necessary, that is, mathematical reasoning belongs to their conceptual, metaphysical basis – what Husserl would call the regional ontology of those sciences.

Much more could be said about the Peircean doctrine of diagrammatical reasoning. Here, I shall only emphasize how the radical redrawing of the connections between the formal sciences, the regional ontologies of the special sciences, the empirical data of those sciences, observation, and reasoning urges us not too easily to accept simpler dualisms like those of concept and intuition, observation and reasoning, theory and data, epistemology and ontology – like all such dualisms they tend to reify and make real contact between the poles of the dualism problematic if not impossible.

Peirce’s grand proposal of diagrammatic reasoning gives us a wholly different picture which I believe may contribute to the solution of many deep riddles pestering philosophy of science to this day.

Cornelis de Waal¹

47 Against Preposterous Philosophies of Mind

[Some] imagine that an idea has to be connected with a brain, or has to inhere in a “soul”. This is preposterous: the idea does not belong to the soul; it is the soul that belongs to the idea. The soul does for the idea just what the cellulose does for the Beauty of the rose; that is to say, it affords its opportunity. (EPII: 122, 1902).

The remark is found in the second chapter of Peirce’s *Minute Logic*, “On Science and Natural Classes”. There Peirce explains that his classification of the sciences is not an artificial one, conceived in aprioristic fashion, but a living or natural classification, resembling rather the biologist’s classification of species. In this context Peirce brings up the relation between ideas and the soul to counter those who say that we first need to know the workings of the human psyche before we can properly classify the things we claim to know. This is the same objection that Peirce makes against psychologism in logic. Peirce’s remark, however, reaches far beyond that of a proper classification of the sciences. It captures a view of the mind that runs counter to the tradition in a most radical way. The remark is not an isolated comment either. For instance, more than three decades earlier Peirce illustrated his view by writing: “just as we say that a body is in motion, and not that motion is in a body we ought to say that we are in thought, and not that thoughts are in us” (W2: 227n).

I particularly like the quotation because it encapsulates a concise frontal attack on the modern conception of the mind as it is shaped by, and after, Descartes – a conception that is still very much alive even today. In fact, it addresses not only the original dualistic interpretation – with its radical separation of mind and body – but also its monistic offspring, such as the mind-brain identity theory. Whether we adhere to a dualistic or a monistic account, the basic notion remains the same: our thoughts are believed to spring from some inner source. Not without cynicism, Peirce observes that though Descartes’s idea of a pineal gland is routinely ridiculed, “everybody continues to think of mind in this same general way, as something within this person or that, belonging to him and correlative to the real world” (CP 5.128). This modern conception is further reinforced and intertwined with the modern conception of man as an autonomous individual who enters society by choice and preformed. Our inter-

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action with others does not shape our mind; it merely gives it content. In the short space allotted I will say something about this attack on the modern conception of mind and the inspiring alternative it opens up.

In the quotation, Peirce calls the belief that ideas inhere in a soul preposterous. The *Century Dictionary*, to which Peirce amply contributed, defines preposterous as “having that last which ought to be first”, referring to the word’s origin as the combination of *præ* and *posterus*, the Latin for “before” and “coming after” (CD: 4697). Though over time the word accrued other meanings, Peirce’s ethics of terminology suggests he might stick to the original one. In more recent times, Jacques Barzun has been talking of the *fallacy of preposterism*. By this he means the fallacy of “seeking to obtain straight off what can only be the fruit of some effort, putting an end before the beginning”.² Susan Haack has drawn this fallacy more directly into the moral realm, stating that preposterism causes sham reasoning: One is not genuinely interested in what is true, but begins by expostulating what one wants to be true and then uses inquiry to find one’s support for it – and we all know that it is much easier to convince someone of what he already believes than to convince someone of something he does not believe, or has not yet formed an opinion about.³ The generally held belief that we have a soul, or mind, is a prime example of something that has been found important enough to invite preposterism. Historically, the reasons why we have ascribed a soul to ourselves have varied greatly. To name but a few, we have brought in the notion of a soul as a plausible explanation for how we think, feel, and put our body in motion; as a way to develop a meaningful theory about life after death; as an anchor for theories that rely on the concept of autonomous moral agents; and as the foundation for an epistemology that sought to ground all knowledge in the knowing individual – Descartes’s famous *ego cogito*. It would not be incorrect to say that typically we start with a notion of the soul that for whatever reason we know *has* to be true – that is unquestionably true – and then proceed to show that reality conforms to it. We know what we are looking for, and thus we find it.

If instead we want to put first things first, where do we begin? Taking Peirce’s quotation as our guide, we should first explore these so-called ideas. When we reflect upon our thought, it is ideas that we perceive. Hence, to put the soul, or the mind, or the brain ahead of ideas is preposterous. The ideas come first and the soul, mind, or brain, as an explanation for the presence of these ideas and their interconnections, comes after. A familiar way of talking about ideas is

² Michael Murray (ed.). 2002. *The Jacques Barzun Reader*. New York: Harper Collins. 398.

³ Susan Haack. 1997. Science, Scientism, and Anti-Science in the Age of Preposterism. *Sceptical Inquirer* 21(6).

Locke's. Locke uses the term to stand for "whatsoever is the Object of the Understanding when a Man thinks".⁴ Peirce is in broad agreement with this (CP 1.285), though he objects that Locke and his fellow empiricists are preposterous about ideas. Their conception of ideas comes already pre-loaded with lots of metaphysics. Instead, Peirce develops what he calls phaneroscopy, which studies not ideas but the *phaneron* as it immediately presents itself independently of any act of the understanding, including those acts that shaped the empiricists' notion of ideas. With the *phaneron* Peirce means "the collective total of all that is in any way or in any sense present to the mind, quite regardless of whether it corresponds to any real thing or not" (CP 1.284). Connecting it all back to Peirce's classification of the sciences, phaneroscopy is, for Peirce, the most basic of the positive sciences.

Hence, putting first things first, it is with phaneroscopy that we must begin, not with a Cartesian *ego cogito*, or with the need for some medium that can satisfy our desire for immortality or onto which to paste our personhood. Making what he takes to be minimal assumptions about the *phaneron*, and with the help of a branch of mathematics that is virtually presuppositionless (topology), Peirce extracts from the *phaneron* three categories that are present in anything we can possibly think of: firstness (the pure quality of being what it is, positively, and independently of anything else), secondness (the unmediated opposition of a first to something it is not), and thirdness (a positive relation between two firsts that are second to each other).⁵ Suppose that after a long day of travel the next morning you wake up, slowly, in a strange bed. When in that brief moment between sleep and wakefulness you become dimly aware of a general presence, you are close to experiencing pure firstness. When you subsequently become dimly aware also of yourself as being there, an element of secondness enters as what you first experienced is now second to you. This is close to an experience of pure secondness, as the two are still unrelated. When you subsequently recall the travels of the previous day, thirdness emerges, as a positive relation is being established between you and the room. Here, I think, we see the root of our notion of a soul, or a mind, or a self, etc. as a yet undefined (phaneroscopic) opposition that can be fleshed out at the level of thirdness.

First, though, we need to take a step back and ask how anything can be lifted out of this *phaneron* to begin with. Peirce finds the answer in normative science. Normative science studies the *phaneron* insofar as it conforms to certain

⁴ John Locke, *An Essay Concerning Human Understanding*, edited by Peter H. Nidditch (Oxford: Clarendon Press, 1975), I.i.8.

⁵ For a brief account, see Cornelis de Waal, *Peirce: A Guide for the Perplexed* (London: Bloomsbury, 2013), chapter 3.

ends. Hence, it says that certain things can be lifted out of the phaneron by exploring motives. As is well known, Peirce divides normative science into esthetics, ethics, and logic. In the esthetic mood we extract from the phaneron something that imparts a positive simple immediate quality of totality (CP 5.132); esthetics aims to identify what is “objectively admirable without any ulterior reason” (CP 1.191). Peirce next distinguishes ethics, which studies the *conformity* of action to something admirable. Finally, logic studies a particular type of action, called reasoning, in relationship to *its* end, which is truth, or the correct representation in thought of how things are. Normative science thus allows us to extract from the phaneron *ideas*, like “the earth revolves around the sun”, “there is a ship at the horizon”, and “we have a soul”, some of which are true and others not.

How does this all relate to our notion of a soul or mind? In the late 1860s, Peirce addresses the issue as follows (W2: 202): Though at birth the child is conscious, he does not yet have what Peirce calls a self. The latter is acquired in the interaction with others and with the environment more generally. Peirce gives the example of a mother who warns her child that the stove is hot. The child – whose experience with hot and cold is restricted to what he immediately feels – disbelieves what he hears because the stove does not feel hot to him. It is only upon touching the stove that the child discovers that his mother’s testimony was a better sign of truth than his own experience. Hence, the child becomes aware of error and ignorance, and in effect he responds to it by positing, not deliberately but as a matter of course, something like a self, mind, or soul, in which those errors and his ignorance can inhere. Our initial notion of the self thus emerges from our experience of opposition – from things being different than we think them to be. In attempting to get a better understanding of this predicament, various questions can be asked. Is this hypothesis of a *single* self not premature? Why not say that the various experiences of discord lead to a multiplicity of selves? If there is a single self, what constitutes its unity? Can we somehow gain direct access to its innards? How does self relate to consciousness? Is there more to self than an accumulation of error and ignorance – of our idiosyncrasies, of our not fitting in? Etc.

Given how the self enters the scene, the most obvious answer is that we come to know it through a prolonged interaction with it. This is pretty much how we come to know anything. Questions like the unity of the self, or its persistence through time, could also find an answer this way – we come to know it like we come to know the unity or persistence of everything else that enters our experience, whether grapefruits or train stations, namely through our interactions with it. Some have argued that we have an immediate access to the self because we are conscious of it. Peirce, however, sees serious problems

with identifying our mind or self with our consciousness of it. Though our nervous system happens to exhibit both the phenomenon of consciousness and that of mind, this does not prove them identical, and the discovery of unconscious mind is a clear strike against it (CP 7.364). Peirce sees the relation as follows: When we are conscious of something – for instance, that rose bushes have sharp thorns – this is merely the inward aspect of what is essentially an outward fact. And it would be a mistake to confuse the former for the latter, or to simply assume them equivalent. Peirce argues further that how we are conscious of our own thoughts is not in any essential way different from how we are conscious of common facts, like seeing a tree down the road, hearing a train cross a bridge, or smelling that the toast is burnt.

Peirce's response lies in his semeiotics. We appear to ourselves – as everything appear to us – as a sign, that is, as something that stands for something else in some respect. Every perception, including the products of what is commonly called introspection, is an interpretation of something (i.e., a sign) that is made determinate by something it is not (the object the sign is a sign of). We do seem to have immediate experiences, say, when we experience an unexpected blow against the head, but that is merely a limiting case. What makes it immediate is not some direct insight, but that it is not (yet) determined by something it is not – say the stray baseball that was responsible for it. All meaningful perception is mediated; it is the result of an abduction, conscious or unconscious, in which it appears as a plausible hypothesis – that is, as something worthy of being lifted from the phaneron. This is true also for our experience of self.

It next becomes our task to flesh out this hypothesis, and to do so independently of anything else we want our selves to be. Because space is limited, I can only give the very beginnings of a brief sketch. Since we appear to ourselves as an (admittedly complex) sign, we appear to ourselves as second. The result is a duality that manifests itself as an inner dialogue wherein we constantly chase our own tale without ever catching up: we endlessly replace our self with a new interpretation of our self. The sign that we are to ourselves is thus always a sign external to the new self that is being generated in the interpretation of our old self, and which itself emerges as a sign to be interpreted. Seen this way, there is no essential difference between my being in dialogue with my self (or myself) and my being in dialogue with some other self. The issue is merely one of access. In the dialogue we carry on with our self we have accustomed ourselves to suppressing our vocal cords, thus creating a silent conversation that only we can hear. Moreover, through our memory we have access to information, however dubious at times, that others have not. These differences, however, are inconsequential. There are inaudible dialogues between others as well,

and there is a great variety of sources of information, all with their own restrictions on who can access them and when.

Our discussion shows that the conversation with one's self is derivative. We are not born talking to ourselves but only acquire this trait by having first conversed with others. Hence, in our exploration we should begin with the communal mind, the mind that we come to partake in after birth, as it is from this that our so-called individual minds, or souls, are subsequently distilled. It is the ideas that shape our self, not our self that shapes our ideas; we learn to speak about ourselves by being spoken to, sometimes with disastrous consequences. Earlier we saw that we begin to attribute a mind, self, or soul, to ourselves (the terms vary) when we come to realize that sometimes there is a discrepancy between what we think and how things are. This consciousness then comes to suggest what belongs to this mind and what does not. We realized, however, that this rests upon us confusing the thought, or the idea, with our being conscious of that thought. This being conscious of the thought is merely its inward aspect – something that accrues to the idea without belonging to its essence. Put in semeiotic terms, albeit not Peirce's, it is part of the sign vehicle without being part of the sign proper. Take a weathervane that signals the direction of the wind. This weathervane has many elements that enable it to act as a sign – afford it its opportunity as Peirce has it. These elements, however, are not essential to the weathervane acting as a sign because they could have been very different – the weathervane could have been made of different material, have a different colour, shape, size, etc. Thus, if my thinking that the earth revolves around the sun constitutes a sign (because at that moment this is how I appear to myself), my being conscious of it has the same relationship to the thought as the chicken on a weathervane has to the direction of the wind. It is part of the vehicle that enables that particular sign action to occur without being essential to it. One and the same thought-sign – say that the earth revolves around the sun – can reside in anything that enables it to act as that sign. Though this surely includes individual human consciousness, it is certainly not limited to it. It can be written in a book, carved in stone, painted on canvas, or displayed with a Java app on a website. In fact, Peirce is keen to observe that it makes far more sense to say that an author's thought resides in his books, of which countless copies are printed, than in his brain. In determining its meaning it is not the intention of the author that counts, nor the consciousness that generated or accompanied the thought, but the interpretation by others, including the author's future self, and this is a result of the sign action of the thought on paper. Once the book is printed, the author too becomes a reader.

Now what can we say of the unity of the self or rather, of ourselves, or of its persistence through time? I believe that I am the teenager that played rugby

at eighteen, the journalist that covered the fall of the Berlin Wall in his late twenties, the philosopher that wrote a book on Peirce, etc. One way of stating this is that all those moments belong to one and the same person. If the self is how we appear to ourselves, then we can look at personhood as a consistent thread through a multiplicity of selves – both synchronic and diachronic – which together constitute a sign that elicits interpretation. We can even look at the body, with all its changes and transformations, as its sign vehicle. Note, though, that such personhood is not an isolated, internal affair. It is a public affair, even though for much of it I am the only witness; it includes what others say or think about me, even without my knowing it. Given what is said, it is not necessary that everything that forms a consistent thread through a multiplicity of selves, and would thus be a person, be all connected to a single body or follow a single temporal train. A football team, and even a book or a theory, could be a person. The term might apply even to a bulky report on global warming written perhaps by a hundred experts of whom none has a clear picture of the issue at hand or of all that the text in a broad sense entails.⁶

All of this at best hints at some most rudimentary beginnings of a criticism of the traditional conceptions of consciousness, mind, soul, self, person, etc., with its semeiotic alternative – both suggested by Peirce's writings and inspired by the above quotation.

⁶ For a fuller discussion see Cornelis de Waal's *Science Beyond the Self: Remarks on Charles S. Peirce's Social Epistemology*. *Cognitio: Revista de Filosofia* 7.1 2006: 149–63.

Douglas Anderson¹

48 Dream and Drama: Peirce's Copernican Turn

Suppose a fairy were to say to you, "You have put me under such an obligation to you that now I will wave my wand and you shall have any dream you like . . . Now what will you dream? How would you like to have it a dream of the perfume of attar of roses, or just a pure unalloyed sense of bliss?" If it were me, I should say "Not a bit! On the contrary, it must be a dream of extreme variety and must seem to embrace an eventful history extending through millions of years. It shall be a drama in which numberless living caprices shall jostle and work themselves out in larger and stronger harmonies and antagonisms, and ultimately execute intelligent reasonableness of existence more and more intellectually stupendous and bring forth new designs still more admirable and prolific". (Manuscript 310, 1903).

For many years Kant's thought has been considered the fulcrum on which modernity shifted toward newer ways of philosophizing. I have a hunch that as we move farther away the work of Charles Peirce will be found to be more and more central to this turn in philosophical thought. If Kant was perhaps its necessary condition, Peirce may have been its sufficient condition. Peirce saw the peculiarity of the end of modernity in the skepticism of Hume. As he saw it, Hume was a committed deductivist who at the same time seemed to see that only induction would produce any progress for human inquirers. Nevertheless, because induction could not yield the certainty of belief that a deductivist epistemology demands, Hume decided that we have no real knowledge at all. Though Peirce argued that Hume's attempt to deal with statistical inquiry was uninformed and inadequate, he also recognized its importance. Indeed, Peirce maintained that bringing statistical reasoning into the world of logic as a theory of inquiry or truth-pursuit was the most significant development in that domain since the Middle Ages.

Peirce's choice of dream reflects this significance. Instead of choosing a fixed world of one sort or another – a vision of a static utopia – he chose a world of risk, creativity, and temporality. His is a dream in which spontaneity and developing orders live together – a world in which Empedocles' love and strife are both effective. The world is a drama that we may in part come to understand and in which one may in part effectively participate in a variety of ways. For Peirce, as for Spinoza and the German idealists, we are in and of the world; and we have the ability to make a difference in its development if only in small ways.

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Peirce's dream is for a world that is always unfinished and always in creation. Human purpose is highlighted in such a world – we may aim to learn about the generalities of such a world – about its laws, categories, and local aims. It is a world in which this learning may help us to bring about short-term consequences that ameliorate our present conditions. This is precisely the thread of pragmatism that both William James and John Dewey found embedded in Peirce's thought. Compare Peirce's line that we may “ultimately execute intelligent reasonableness of existence more and more intellectually stupendous” with Dewey's focus on “intelligence” in his classic *Experience and Nature*. For Dewey, we are to use our intelligence to improve upon our present conditions and situations. We improve our scientific understanding; we jettison dead institutions and create living ones; we create new artistic visions that express our present hopes and conditions.

There is perhaps no better contemporary example for seeing the force of Dewey's emphasis on intelligence and for seeing the significance of Peirce's dream than our present engagement with the issue of climate change. We are in need of abductions both concerning the variety of causes of climate change and concerning the possible worlds we have ahead of us that *depend on what* we believe and *how* we act. Our logic of inquiry hangs on what statistical analyses can tell us about the past contingencies that have led to our awareness of significant climate change. And our future depends on how we choose to respond to what we learn. Contra Hume, we do learn about the world – we simply don't learn with finality. Instead of choosing a priori systematic answers to our questions, and instead of taking any party line of the present, we must use the intelligence we have to follow the drama of the cosmos and to engage it where we think we can make a useful difference.

Here we see Peirce's insistence on the relatedness of the normative sciences. We must, at least in the short run, choose a world that stands in concert with our overall aesthetic aims, and we must choose to conduct ourselves in the ways that lead us and our world in that direction. Most of us will choose an environment in which we and those around us may flourish and live well. That choice places on us a duty to act in ways that will effect some version of that sustaining environment. Moreover, we must ongoingly engage in inquiry so that we may continue to adjust our beliefs and actions to the “truth” in whatever ways seem reasonable as it develops. We must work to “bring forth new designs more admirable and prolific”.

In this dream I find Peirce's radically abductivist/inductivist response to modern thought. As fallible creatures, we must learn to live with knowledge that is always in transition and with beliefs and commitments that are always open to radical revision. But I also find in Peirce's dream – and in his philoso-

phy generally a pragmatic temper guided by a Greek aesthetic. We are in this world not only to figure it out the best we are able but also to help create moments of beauty and goodness to the extent that we are able. Peirce is at once a systematic though non-deductivist thinker of the highest order and an experientialist committed to our living in the precarious drama of an evolving world.

Marco Annoni¹

49 Words that Matter: Peirce and the Ethics of Scientific Terminology

Words have their rights as well as their duties, which must not be trampled upon. There is an ethics of words, because words are a social institution. Science, too, is a social business, and cannot prosper without a common understanding as to how words shall be used.
(MS 1573X: 32, 1903).

The year 1903 was for Peirce a dreadful and yet productive year. He was living in Milford – or at *Arisbe* as he preferred to name the place of his semi-voluntary confinement – without a fixed research position and no stable source of income. To his dismay, in March his application for a Carnegie fellowship had been rejected together with his last chance of receiving funds to complete his researches. Aside from two short but important series of lectures delivered at Harvard and at the Lowell Institute respectively, in 1903 Peirce's public impact had been quite limited. Following a characteristic pattern, he reacted to this lack of institutional acknowledgment by redoubling his solitary efforts, thinking and writing feverishly on a plurality of different theoretical fronts. In this respect, the manuscript 1573 – from which the above quotation is taken – is iconic of what Peirce went through during these difficult years; it is composed of over 400 pages dealing with a heterogeneous host of issues ranging from metric geometry and Coast Survey material up to the topic of this brief commentary, the ethics of scientific terminology.

As the above quotation testifies, despite being isolated from the academic and scientific circles of his time, Peirce never lost his faith in the idea that science is a community endeavor rooted in a social principle. In the 1868–69 articles in which he first introduced his semiotic theory of cognition, Peirce famously affirmed that the notion of what is “real ... involves the notion of a COMMUNITY” (EPI: 42), and ten years later that “logicality inexorably requires that our interests shall *not* be limited. They must not stop at our own fate, but must embrace the whole community ... Logic is rooted in a social principle” (EPI: 149). As Peirce further argues in the 1878–79 series of papers entitled *Illustration of the Logic of Science*, scientific inquiry can be understood as particular strategy to fix our beliefs. Among the diverse ways in which our beliefs – and hence our habits of action – can be “fixed”, science is superior because it alone

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is self-corrective in the long run. This capability of auto-correction rests on two requirements. The first is the belief in an external reality whose “characters are independent of how you or I think” (EPI: 136); the second is the hope in a community that is capable of pursuing inquiry indefinitely so as to eventually discover and correct all erroneous beliefs. Thus, when Peirce writes that “science is a social business”, what he means is not just that scientific inquiry may profit from social collaboration, but rather that the very logic of discovery is grounded in a communitarian dimension.

Though Peirce’s idea of the “indefinite community” has been investigated in some depth, it is seldom acknowledged that he also maintained that no such community could exist without the adoption of a shared terminological jargon. Yet the success of the community in pursuing inquiry crucially depends on its ability to preserve the continuity of knowledge across its actual and future members. Without a “shared understanding of how words shall be used”, scientific inquiry and other social activities become hopeless endeavors – as the Biblical myth of the Tower of Babel reveals. There cannot be a community of inquirers if there are not people who can share thoughts and information and thus transmit knowledge. Coordinating linguistic practices is thus a necessary precondition for inquiry to exist and be successful. This is true for language in general, but it becomes a critical factor when we consider the case of that special class of signs that are the technical terms used in the sciences.

Peirce, who as a professional lexicographer defined more than 11.000 scientific terms for various dictionaries, was well aware of the importance that the creation of a technical vocabulary has in establishing a field of research. In illustrating this point, he frequently cited the historical cases of the sciences of biological classification and the terminological reform they underwent during the eighteenth century. Being an experimental scientist himself, a Harvard graduate in chemistry, and a former pupil of Luis Agassiz, Peirce knew well that for a research field the creation of a system of technical signs to indicate its objects of study is not a point of arrival but one of departure. For both chemistry and biology, the adoption of a coordinated system of terminology was not the upshot of a major conceptual revolution, but it was one of the key factors that ignited that revolution in the first place (EPII: 265). Another historical case that he considered noteworthy was the system of philosophical nomenclature introduced by the Scholastics. Contrary to the opinion that Scholastic terminology was too abstruse and cumbersome, Peirce believed instead that it formed “a system at once precise and elastic” whose principal virtue was that of being constructed according to public rules by means of which each term could have been understood by “anyone who is acquainted with these principles” (W2: 274).

From the historical cases of the sciences of biological classification and of Scholastic terminology, Peirce took two lessons. First, terminological revolutions are a matter of communitarian coordination and consensus. As the history of science reveals, for the coming into being of a new area of research the proportion of people embracing the new terminological system may be more important than its inherent logical virtues. As Oliver (1963) noted, it makes little difference whether we drive on the left or on the right, so long as any other driver belonging to our community does the same. For a community, achieving consensus over terminological issues may require a long process of public deliberation, and the constitution of institutional and regulatory bodies such as congresses, conferences, commissions, etc. But independently from particular arrangements, what cannot be dispensed with is that the consensus of the community is instrumental to the success of any proposed solution. Second, a community is necessary not only to introduce a technical jargon, but also to maintain it. As inquiry, and more generally semiosis, goes by, words inevitably acquire new meanings and wear off old ones. Hence, static systems are not enough, as the Scholastics knew, and what is required are *rules* that regulate how and when a new term shall be introduced or redefined. Once a technical vocabulary is adopted, a constant effort should then be exercised to “keep the essence of every scientific term unchanged and exact” (W2: 264). Scientific congresses, terminological commissions, and logical rules are thus all ways of preserving the continuity of knowledge through linguistic coordination. Scientific technical terms are thus “social institutions” because they gain their linguistic currency only in reference to the public and institutional acts of that community for which and by which they were coined.

From the recognition that scientific terminology is meaningful only in virtue of its social nature, it follows that every individual speech-act may have important social consequences. There is “an ethics of words” precisely because our personal linguistic conduct may harm the whole community of inquirers. As Ketner (1981) noted, Peirce’s ethics of scientific terminology belongs to a historical tradition that through Bacon refers back to some passages of Locke’s *Essay*, where we can read:

For language being the great conduit, whereby men convey their discoveries, reasoning, and knowledge, from one to the other, he that makes an ill use of it, though he does not corrupt the fountain of knowledge . . . breaks or stop the pipes whereby it is distributed to the public use and advantage of mankind. He that uses words without any clear and steady meaning, what does he but lead himself and other into errors? And he that designedly does it, ought to be looked on as an enemy to truth and knowledge. (Locke 1690: 149–150).

For Locke as for Peirce, the words of science are the means whereby public knowledge is distributed and preserved, and thus whoever chooses to breach its continuity commits a wrongful act with respect to the very end for which the community of inquirers is constituted in the first place.

But what are the specific “rights and duties” that we have with respect to the use of scientific technical terms? Aside from the various lists of terminological rules elaborated by Peirce himself (CP 7.468–517; MS 434; CP 2.226), across his writings some partial answers to this question can be identified. For example, Peirce thought that if someone invents a new scientific conception, then he also has the “privilege and the duty” to provide a suitable name for it (W2: 265). He also believed that once a new term has been publically introduced, others ought to respect such an act of baptism, and “whoever deliberately uses . . . in any other sense that which was conferred upon it by its sole rightful creator commits a shameful offence against the inventor of the symbols and against science, and it becomes the duty of the others to treat the act with contempt and indignation” (W2: 265). Though the class of specific normative acts defining Peirce’s ethics of terminology is broad, they all strive to embody the same commandment “do not breach the continuity of knowledge” or “do not act arbitrarily” – i.e., in a way that cannot be explained through the appeal to some rational and public rules of conduct.

If preserving the continuity of knowledge is the rationale behind the constitution of the community of inquiries, arbitrariness is the feature shared by all breaches of such continuity. Each arbitrary act marks a discontinuity, a fracture in the process of the transmission of knowledge that requires an active effort to be avoided. Peirce’s ethics of terminology is thus much focused on positively fostering the continuity of knowledge as it is on exercising a conscious effort to *resist* any act of linguistic arbitrariness. This effort ought to be directed first and foremost to constrain our deliberate conduct. Practically, this means resisting the temptation to use a technical word for which we do not know the exact meaning, and making the effort to look for its definition. It also means to exercise a conscious effort to keep the reference between scientific words, concepts, and objects as stable as possible, introducing a new term in each case that one is no longer deemed useful. In other words, in dealing with technical terminology we act ethically any time we act as if our objective was to foster the ends of the community rather than just our private and selfish goals. This does not mean that the reference to the ends of the community should always trump the ends of individuals. As Peirce clearly states, “the health of the scientific communion requires the most absolute mental freedom . . . It thus becomes one of the first duties of one who sees what the situation is, energetically to resist everything like arbitrary dictation in scientific affairs, and above all, as to the use of terms

and notations” (EPII: 263). The efforts inherent to any ethical action should thus be directed to impede any arbitrary rupture of the continuity of knowledge from individuals to the community and vice versa – inasmuch as both kinds of breaches are equally likely to impede or block the path of inquiry.

In conclusion, there are at least two ways in which the quotation above may be relevant in fostering Peirce’s intellectual legacy. The first way concerns Peirce’s habit of coining new technical terms. Besides the famous case of the words “pragmatism/pragmaticism”, Peirce is well known for having introduced a deluge of neologisms throughout his writings. This practice has often been interpreted as the sign of a too isolated and egocentric mind and also as one of the major barriers preventing the further diffusion of his thought. Quite on the contrary, as the initial quote clearly demonstrates, Peirce was well aware of all the ethical implications deriving from such a practice, and his theory of the ethics of terminology is just one of the many results of his prolonged effort to gain a completely rational and therefore public control over his expressive practices. Secondly, Peirce’s signs of thought are arguably more alive today than one hundred years ago, and hopefully they will be even the more so in the future. In this respect, the initial quote is reminding us that the further development of Peirce’s legacy will depend not just on the intellectual abilities of the community of his interpreters, but also on their moral and ethical commitments.

Mats Bergman¹

50 The Curious Case of Peirce's Anthropomorphism

To say . . . that a conception is one natural to man, which comes to just about the same thing as to say that it is anthropomorphic, is as high a recommendation as one could give to it in the eyes of an Exact Logician. (CP 5.47, 1903).

In the loose coalition of thinkers identified as the ‘classical pragmatists’, C. S. Peirce stands out as a staunch realist and a promoter of a scientific approach to philosophy. No doubt, many of the other contributions to this volume will explicate various aspects of his realism and take note of his aversion to individualistic nominalism, which differentiates his perspective from the constructivist and anthropocentric tendencies that tend to permeate much of pragmatist thought, old and new alike. And rightly so, for it was a distinction that Peirce insisted on when he rechristened his version of pragmatism ‘pragmaticism’. Worried by the subjectivistic, psychologistic, and looser ways of thinking exhibited by other leading pragmatists such as William James, F.C.S. Schiller, and John Dewey,² Peirce promoted a conception of philosophy as “a strict science, passionless and severely fair” (CP 5.537).

In view of this hard-line agenda, a reader of Peirce’s mature pragmatist writings may be in for a surprise. In the very same period in which Peirce was gradually driven to invent a new name for his way of thinking – that is, about 1903–5 – he also recurrently spoke approvingly of *anthropomorphism*, even occasionally suggesting that his own version of pragmatism should be understood in such terms.³ He claimed that the “general leaning” of pragmatist results were toward “the naïve, toward common sense, toward anthropomorphism” (CP 8.191); but at the same time, he contended that anthropomorphism was “expressive of the scientific opinion” (CP 8.262). More broadly, Peirce insisted that

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² However, contrary to some later assessments, Peirce did not wish to completely dissociate his pragmaticism from pragmatism, which he viewed as an alliance of sympathetic minds or a “vague tendency” of thought rather than a strict doctrine (Scott 1973: 371, 373 [Scott’s article contains a substantial part of the Peirce-Schiller correspondence, and is hereafter abbreviated PSC]). When Peirce complained about “lawless rovers” and “kidnappers” in ‘What Pragmatism Is’ (1905), he explicitly referred to misuses of the term ‘pragmatism’ in literary magazines, not to its employment by the better-known pragmatist philosophers.

³ In a 1905 letter to Schiller, Peirce claimed that he had always made pragmatism subordinate to anthropomorphism in his lectures and conversations (PSC 376).

“shamefacedly slinking away from anthropomorphic conceptions of the universe” was tantamount to a dishonourable denial of “our birthright as children of God” (CP 1.316). Most strikingly, perhaps, he proclaimed that calling a conception ‘anthropomorphic’ was “as high a recommendation as one could give to it in the eyes of an Exact Logician” (CP 5.47).

For the most part, Peirce scholars have simply ignored this seemingly incongruous ‘anthropomorphic turn’. Some studies of Peirce’s religious writings have noted its close connection to his theism (e.g. Orange 1984; Potter 1996), but the more radical suggestion – that anthropomorphism should be agreeable to a strict logician as well as a credible approach in scientific practice – has been largely passed by in silence.

This is certainly understandable. From a contemporary philosophical perspective, ‘anthropomorphism’ is deeply suspect, easily grouped together with ‘sophism’, ‘relativism’, ‘subjectivism’, and other commonly abhorred concepts. In the empirical sciences, a lapse into anthropomorphic thinking is typically viewed as a major methodological blunder – a sign of a lack of the kind of precision and rigour that Peirce felt that philosophy should adopt from the more successful sciences. Consequently, it is not surprising that T.L. Short (2007a), in his major re-interpretation of semeiotic, insists that the Peircean theory of signs is not “grossly” anthropomorphic in spite of its broadly teleological leanings.

But how can we explain Peirce’s open approval of something as problematic and widely shunned as anthropomorphism? Is it not, almost by definition, in conflict with a dispassionately scientific and solidly realistic worldview? Did he mean to be taken seriously, or are there simpler explanations for this apparent lapse in judgment?

Perhaps the easiest approach would be to dismiss Peirce’s anthropomorphic tendencies as mere momentary slips – odd blunders for a thinker who prided himself on his scientific strictness, for sure, but ultimately irrelevant in the broader picture. Such a solution would receive some support from the fact that Peirce’s references to ‘anthropomorphism’ occur mostly in drafts, letters, and lectures, most of which were never even submitted for publication during his lifetime. One might also appeal to the scarcity of occurrences; whatever anthropomorphic entanglements Peirce may have gotten himself into, they were relatively isolated and rare.

However, the anthropomorphic tendency is much more entrenched in Peirce’s thought than one may at first realise. In fact, Peirce himself claimed that he had been “preaching” anthropomorphism since the 1880s (MS L390); and some traces of this can indeed be detected in the published 1883 article ‘A Theory of Probable Inference’, where Peirce speaks of both our natural ‘anthropomorphic’ metaphysics (CP 2.713) and the ‘anthropological’ character of non-mechanical

knowledge (CP 2.753). Moreover, when Peirce's scattered references to 'anthropomorphism' are duly tallied, it becomes much more difficult to dismiss his usage as a mere aberration. In terms of quantity, at least, 'anthropomorphism' stands roughly on equal footing with 'fallibilism' – a conception that most Peirce scholars have happily endorsed as representative of his philosophical vision.

Still, mere numbers do not prove anything. A second, also partly plausible explanation for Peirce's anthropomorphic follies would be to construe them as ill-advised "sops to Cerberus" (cf. SS 81). The term 'anthropomorphism' tends to crop up in lectures and in letters to the leading pragmatists of the day. Perhaps Peirce was just pandering to his audience in desperation of making himself understood and accepted? These manifestations of anthropomorphic tendencies in his thought would then be comparable to – and perhaps even directly related to – his infamous substitution of the more readily intelligible 'interpreter' or 'person' for the proper technical concept of 'interpretant' (which purportedly excluded any reference to human 'subjects') in some of his definitions of the general sign relation.

Such a reading – that is, interpreting Peirce's anthropomorphism as a concession to pragmatist sensibilities – might find some support in the fact that he was often addressing Schiller when discussing the issue. Schiller associated pragmatism with a variant of humanism, which James had interpreted as an attempt to 're-anthropomorphise' the universe.⁴ On the other hand, one would then need to concede that Peirce went rather far in his attempts to please, something that would seem to be out of character; if anything, Peirce was more of a contrarian than a flatterer. For not only did Peirce speak approvingly of the anthropomorphic aspects of pragmatism; he also delineated his own take on anthropomorphism in some detail in a series of letters to Schiller. In addition, Peirce approved of many features of Schiller's approach, even indicating that pragmatism was largely in accord with the conclusions of Schillerian pragmatism (PSC 372). Unless we wish to accuse Peirce of being just an opportunistic sycophant – which might be a first – then some clarification of the motivations behind his anthropomorphic leanings and their implications is surely needed.

If Peirce's anthropomorphic remarks cannot be explained away as momentary blunders or rhetorical subterfuges, then we must take Peirce's approval of anthropomorphism seriously; but how can we, given his proven track record as the champion of realism and scourge of nominalism? The association with

⁴ However, it is notable that Schiller, who had discussed anthropomorphism in his *Riddles of the Sphinx* (1891), later wished to distance himself from the term that he felt to be too clumsy, inflexible, and discredited – "a term of disparagement whose dyslogistic usage it may prove difficult to alter" (Schiller 1903: xvii).

Schiller, who accepted the Protagorean slogan “man is the measure”, only seems to make matters worse. Does not this anthropomorphic stance imply just the kind of subjectivism and relativism that Peirce abhorred?

A third approach to Peirce’s anthropomorphism would be to frankly acknowledge these problematic predilections, but to limit the damage to his philosophy of religion. Peirce’s anthropomorphic assertions are often directly connected to his theistic rejection of an intellectualistic, impersonal God – a view that seems to spring from a spiritual awakening he experienced in the 1890s. This theistic deity is an anthropomorphic God – or rather, a highest intelligence understood in broadly human terms, as something “vaguely like a man” (CP 5.536). However, as Vincent Potter (1996) has noted, this viewpoint is “not likely to enthuse either traditional theists or hard-headed scientists” (155) – two groups united by their aversion to anthropomorphism, if rarely by anything else. Furthermore, whatever Peirce hoped to achieve by endorsing anthropomorphism, it was not restricted to the sphere of religion in any ordinary sense. Rather, he tended to argue that his theism was supported by or followed from a logically acceptable form of anthropomorphism.

To truly understand how Peirce could have made such perplexing claims, we need to dig a bit deeper into the riches of his manuscripts and letters. For although he never produced a definitive version of his anthropomorphic approach, a reconstruction of the bits and pieces we have at our disposal begins to reveal the outlines of a missing piece of the Peircean puzzle. The most complete, if still sketchy, articulation of Peirce’s anthropomorphism was crafted in his 1905 correspondence with Schiller. There Peirce, in a number of overlapping drafts, identified three components of anthropomorphism – three theses, which are suggestively associated with various aspects of his broader philosophical endeavour, and which also, in varying guises, turn up in the series of pragmaticistic manuscripts he composed in 1905–6.

The first anthropomorphic proposition states that the faculties of a human being, like those of any other species of animal, are so closely adapted to his or her needs that he or she is totally immersed in the world of the conceivably pragmatic; therefore, a human agent cannot “have any idea, direct or indirect, exact or metaphysical, of what it would be to think from a standpoint exterior to that” (MS L390). From this it follows that “all affirmations and denials of ‘limits of human cognition’ are totally meaningless except as predicating utter nonsensicality of one another” (MS L390); and this includes the very limit that Peirce’s first proposition itself places on human cognition. Yet, such *denials* of limits are purportedly “golden truth” (PSC 376). In other words, this stance leaves us perfectly free to imagine and think whatever we may, just as fallibilism

does not pose restrictions on our striving for knowledge in spite of its core thesis of human fallibility.

Consequently, this first anthropomorphic proposition, which Peirce occasionally referred to as his rendering of *esse est percipi* (MS L390), constitutes his clearest pragmatistic denial of a view from nowhere; it asserts that we cannot occupy any standpoint exterior to that of the pragmatic domain of actual and conceivable experience. Yet, as, noted, the anthropomorphic boundary is in effect self-negating; it stipulates no actually effective limits on human capacities.

... man is so completely hemmed in by the bounds of his possible practical experience, his mind is so restricted to being the instrument of his needs, that he cannot, in the least, *mean* anything that transcends those limits. The strict consequence of this is, that it is all nonsense to tell him that he must not think in this or that way because to do so would be to transcend the limits of a possible experience. For let him try ever so hard to think anything about what is beyond that limit, it simply cannot be done. You might as well pass a law that no man shall jump over the moon; it wouldn't forbid him to jump just as high as he possibly could. (CP 5.536).

In this respect, Peircean anthropomorphism is not at heart a constricting thesis about human limits, but rather a warning about the futility – if not outright dangers – of endeavours to cleanse our conceptions from all human taints, which tend to divide the universe into the knowable and unknowable. Peirce argued that the “attempt to escape anthropomorphism” would simply be to “repeat the error of Kant” (NEM 4:313). Thus, Peirce connected his view of the inevitability of anthropomorphism to his criticism of Kantian things-in-themselves, and more generally of any attempts to postulate restrictions on human experiential and cognitive powers on *a priori* grounds. From this point of view, the roots of Peirce's anthropomorphism can be traced all the way back to his early criticism of Cartesian philosophy. To the extent that an anthropomorphic viewpoint entails the pragmatic denial of the absolutely incomprehensible, it connects with the common-sensical aspect of pragmatism (see CP 8.168). More positively, this perspective entails that philosophy “must set out from ideas familiar and complex” rather than any imaginary “pure ideas”, “vagabond thoughts that tramp the public roads without any human habitation” (CP 8.112).

According to the second proposition of Peirce's anthropomorphism, our ideals must be human, because trying “to weed the anthropomorphic element out of ideas of the Universe and its coming to existence is only to debase those ideas and eviscerate them of their meaning” (MS L390). To the possible objection that this would leave an uncomfortable level of indeterminacy in our explanations, Peirce replied that this only “goes to show that our highest ideas are necessarily vague” (MS L390). Not coincidentally, during this period Peirce was

also engaged in the development of a theory of semiotic indeterminacy, a central claim of which was that vagueness was “no more to be done away with in the world of logic than friction in mechanics” (CP 5.512).

However, for Peirce, it was precisely this aspect of anthropomorphism that pointed toward theism as the least false idea of that which stood behind the universe (PSC 376). Peirce argued that human beings could not have an “idea of any cause or agency so stupendous that there is any more adequate way of conceiving it than as vaguely like a man” (CP 5.536) or a “*vague* idea of human likeness” (MS L390). In a sense, this anthropomorphic ‘God’ could be construed as a generalised sign of the highest human aspirations imaginable, and thus as closely aligned with the esthetic ideal of the *summum bonum* (see CP 8.262). In this respect, Peirce’s deity was infinite yet indefinitely comprehensible; but he also quipped that he preferred “an old-fashioned God” to “a modern patent Absolute” as a closer approximation to the truth (CP 5.47 n. 1).

This may feel somewhat incongruous. Also, whatever religious, agnostic, or atheistic views one may hold, Peirce’s tendency to equate ‘understanding God’s mind’ with the ultimate aim of science (cf. CP 8.168) may feel rather presumptuous, if not downright blasphemous (toward religion or science, depending on one’s inclination). However, such qualms aside, the broader Peircean point is clear enough; we grasp, initially at least, the ostensibly non-human in terms of the human, plainly because there is no other vantage point. Negatively, anthropomorphism simply denies that it would make any sense to speak of facts absolutely beyond human reach (irrespective of whether the facts are ever actually exposed or not). Given that *our* knowledge is *human* knowledge, what anthropomorphism prescribes is a rejection of the pseudo-scientific illusion of knowledge ‘purified’ from all anthropomorphic ingredients. From a different perspective, this amounts to the argument that an attempt to purge all ‘human’ and figurative elements from scientific language and conceptions is perhaps not impossible in principle, but it is pragmatically fruitless; it would be “like trying to peel an onion and get down to onion itself, the onion per se, the onion an sich” (MS L387).⁵

The third proposition entailed by Peirce’s anthropomorphism is the assertion that human instincts ought to be trusted within their proper sphere – that is, for practical purposes. This is roughly equivalent to the point of view that Peirce presented as ‘sentimentalism’ in his *Reasoning and the Logic of Things* lectures of 1898. It is a controversial thesis; but charitably interpreted, this aspect of

⁵ Compare Peirce’s rhetorical claim that “a pure idea without metaphor or other significant clothing is an onion without a peel” (EPII: 392) to his assertion that “nothing is truer than true poetry” in his defence of anthropomorphic conceptions (CP 1.315).

Peircean anthropomorphism can provide a healthy reminder of the dangers of rationalism. Warning us against the tendency to overrate our conscious reason, Peirce argued that would be “silly to allow the religious ideas, sentiments, and habits in which one has been bred to be disturbed by any rationalism that has not weathered the criticism of centuries” (MS L390). As an aspect of anthropomorphism, sentimentalism can be viewed as a warning against the kind of scientific hubris that can lead to excessive social engineering and even eugenics.⁶

Of course, sentimentalism can also be pushed too far, turning into stagnant conservatism. Peirce wished to free scientific inquiry from the tyranny of traditional and utilitarian constraints; but in doing so, he occasionally slipped into a form of intellectualistic elitism. Arguably, the conservative impulse of sentimentalism needs to be balanced by a dose of the kind of Peircean meliorism that maintains that the “continual amelioration of our own habits . . . is the only alternative to a continual deterioration of them” (MS 674:1).

Be that as it may, lurking behind all three of the theses listed above one may detect a premise, which might be conceived of as the fourth – or perhaps better, the overarching – proposition of Peircean anthropomorphism. It is the supposition of a deep connection – sympathy, even – between the human and what we may too narrowly identify as non-human nature. From the perspective of scientific inquiry, it is the claim that every “explanation of a natural phenomenon is a hypothesis that there is something in nature to which the human reason is analogous” (CP 1.316; cf. CP 5.47). In part, this points toward a close connection between Peircean anthropomorphism and the *il lume naturale* thesis (cf. CP 1.80; CP 1.630; CP 6.10); but approached from a different direction, it suggests the folly of trying to eliminate all anthropomorphic ideas and perspectives from our conceptions. Peirce, who was certainly no stranger to technical neologisms, noted laconically that all our notions were at heart anthropomorphic – a position not too far from James’s (1907) more poetic claim that the “trail of the human serpent is . . . over everything” (64).⁷ More than that: Peirce declared that the human agreeability of an idea – the fact that it *appeared* or *felt* natural to reasonable persons – was sufficient to recommend it to a scrupulous logician (CP 5.47).

⁶ As it happens, Schiller promoted a rather dubious eugenic agenda after the eclipse of his fame as a pragmatist.

⁷ However, this does not mean that James and Peirce would have agreed on the implications of this thesis; where the former tended to associate his ‘humanised’ pragmatism with particularistic nominalism and utilitarianism, the latter considered the anthropomorphic viewpoint to be conducive to both realism and sentimentalism.

So, what does this extraordinarily sweeping claim by an exact logician ultimately amount to? If all our conceptions really are anthropomorphic, is not Peirce's grand thesis at best a trivial truism without conceivable pragmatic bearing? Admittedly, his general philosophical conception of anthropomorphism differs markedly from the usual function of the concept in theology, psychology, biology, ethology, and other more specialised domains of inquiry. Yet, the Peircean viewpoint is not completely dissociated from the usage of 'anthropomorphism' in such fields, where it is frequently employed as a label of disparagement. Notably, Peirce – apparently unconcerned by any possible stigma of unscientific *naïveté* – contended that there can be a cognitive and sympathetic bond between humans and other animals (Anderson 2004).⁸ If granted, this raises a number of ethical questions about our relations to other species; but it also suggests a methodological directive of sorts. If we wish to understand 'non-human' nature, then a strict anti-anthropomorphism is not the way forward; "other things being equal, an anthropomorphic conception, whether it makes the best nucleus for a scientific working hypothesis or not, is far more likely to be approximately true than one that is not anthropomorphic" (CP 5.47 n1). Arguably, some of the great advances in natural science have been initiated by bold hypotheses drawing on likenesses and analogies with more familiar experiences.

T.L. Short (2007b) has asserted that Peirce's anthropomorphic argument against Kantian things-in-themselves "provides no guide to inquiry" (667). In contrast, I would again say that this side of pragmatic anthropomorphism is comparable to that of fallibilism as a regulative principle of scientific practice. It may be hardly more than a reminder to not "block the path of inquiry"; but as such, it is arguably a consequential one. It is at any rate important to realise that Peirce's philosophical anthropomorphism entails a fundamental *denunciation* of anthropocentrism. Strict anti-anthropomorphism tends to simultaneously isolate and lionise human cognition. The result could be characterised as a form of exceptionalism, a hybrid of the thesis that we can only truly know our own experiences and the quasi-positivistic assumption that the rest of the world must be reduced to inhuman data in order to be accurately known. It is a path that can lead to nominalism and scepticism.

Moreover, as a *positive* diktat, Peircean anthropomorphism is primarily connected to the initial, 'abductive' phase of our probes (cf. CP 5.212); basically, it

⁸ "I am confident a man can pretty well understand the thoughts of his horse, his jocose parrot, and his canary-bird, so full of espièglerie; and though his representation of those thoughts must, I suppose, be more or less falsified by anthropomorphism, yet that there is a good deal more truth than falsity in them, and more than if he were to attempt the impossible task of eliminating anthropomorphism, I am for the present sufficiently convinced" (NEM 4:313; cf. CP 1.314).

tells us to keep eyes and mind open to suggestive analogies and continuities. Of course, anthropomorphic prejudices may obstruct inquiry as well, as we tend to interpret outer signals in terms of the signs we know best. Differences in the expressions of emotions between different species provide well-known examples of how first impressions and unsophisticated interpretations can deceive. It might also be advisable to distinguish anthropomorphic *clues* from anthropomorphic *generalisations*; arguably, the latter call for even more caution. As Short (2007b: 668) notes, Peirce's 'objective idealism' may have gone too far in this respect, disseminating 'mind' all over inanimate nature; and similar misgivings could perhaps be voiced with regard to the cosmological dimensions of Peirce's anthropomorphic theism. There is a crucial difference between being receptive to abductive analogies and the inclination to propose prematurely comprehensive generalisations based on such hypotheses.

Yet, I believe that Peirce was fundamentally right when he suggested that the attempt to purge all anthropomorphic ingredients from our ideas, conceptions, and hypotheses is ultimately more damaging to inquiry – and perhaps even to humane life in general – than the risk of being duped by our anthropomorphic 'instincts'. Such dispositions and inferences are certainly not infallible; indeed, philosophical inquiry can be seen as an endeavour to criticise and reform common-sense habits (in the broad sense that includes habits of thought and imagination). Yet, we should keep in mind that such intellectual pursuits are grounded in human experience, no matter how abstract they may be; and a Cartesian cleansing of science from human prejudices is ultimately both illusory and unproductive. For Peirce, an 'exact logician' *par excellence*, the inevitably anthropomorphic character of our conceptions was a fact of life that philosophy simply could not plausibly combat to the bitter end if it wished to grow and flourish.

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51 Peirce and the “Flood of False Notions”

Experience is our only teacher. Far be it from me to enunciate any doctrine of a *tabula rasa*. For, as I said a few minutes ago, there manifestly is not one drop of principle in the whole vast reservoir of established scientific theory that has sprung from any other source than the power of the human mind to originate ideas that are true. But this power, for all it has accomplished, is so feeble that as ideas flow from their springs in the soul, the truths are almost drowned in a flood of false notions; and that which experience does is gradually, and by a sort of fractionation, to precipitate and filter off the false ideas, eliminating them and letting the truth pour on in its mighty current. But precisely how does this action of experience take place? It takes place by a series of surprises. (EPII: 153–154, 1903).

In “On Phenomenology” Peirce writes that experience shapes our knowledge of the world, and that experience teaches us through surprise. Peirce argues that all the content of our knowledge comes from our own minds (via abduction), but our abductions are most often wrong, and experience guides us by surprises, which signal errors in our abductions. This emphasis on surprise is important for understanding Peirce’s empiricism, since Peirce’s philosophy does not fit neatly into the empiricism/rationalism dichotomy of modern epistemology. By way of background, we can examine the difficulty briefly. On the one hand, Peirce seems to be an empiricist in “The Fixation of Belief” where he argues for the scientific method of fixing belief over the methods of tenacity, authority, and *a priorism*, precisely because the scientific method posits an “external permanency” (W3: 253), which acts on the senses, and which, in turn, allows for a self-corrective (unlike the other three methods). Furthermore, in “Pragmatism as the Logic of Abduction”, Peirce begins his discussion of the centrality of the logic of abduction in pragmatism (acknowledging Aristotle) with the view that there is nothing in the intellect that is not first in the senses: “*Nihil est in intellectu quod non prius fuerit in sensu*” (EPII: 227–228).

On the other hand, the case for reading Peirce as an idealist is also very compelling, and on two counts. First, Peirce rejects Kant’s view of the unknowable things in themselves (noumena) in the *Critique of Pure Reason* (in the section “On the Ground of the Distinction of All Objects into Phenomena and Noumena”), and therefore Kantian transcendental idealism (Kant 2007, A254/B310: 350). On this point, Peirce (in his own idealism) seems to follow Hegel (and his idealism) in the *Phenomenology of Spirit* (especially §III. “Force and Understanding: Appearance and the Supersensible World”). Here Hegel writes

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that there is nothing outside the knowable realm, nothing outside inquiry itself, and that the mind sees as much only when it pulls aside the “so-called curtain which is supposed to conceal the inner world” (Hegel 1977: 103). Peirce, in “Questions Concerning Faculties Claimed for Man” (against Kant and following Hegel), writes that “*cognizability* (in the widest sense) and *being* are not merely metaphysically the same, but are synonymous terms” (WII: 208; see also de Waal 1999: 756). Similarly, Peirce in “How to Make Our Ideas Clear” defines truth and reality, saying: “The opinion which is fated to be ultimately agreed to by all who investigate, is what we mean by the truth, and the object represented in this opinion is the real” (W3: 273). Reality is not independent of all thought, just independent of any individual’s thought (W3: 271–3). This view synthesizes Kantian and Hegelian idealism by acknowledging with Kant that we do not have knowledge *now*, but agreeing with Hegel that the world must be knowable by us. Then, going beyond Kant and Hegel, Peirce holds that reality is only knowable by us through inquiry over the course of the long run.

Second, Peirce in “The Three Normative Sciences” argues that all new ideas in science come through abduction (EPII: 205). Of course, that in itself might not appear to undermine empiricism for idealism, but Peirce’s view of abduction is so thoroughgoing that it actually runs through the sensation, which means that there is no Humean or Kantian empirical intuition, no immediate sensuous data. So, like Hegel before him, Peirce, in his own way, overcomes the “myth of the given”, to use Wilfrid Sellars’ phrase from *Empiricism and the Philosophy of Mind* (Sellars 1997: 13 and 77), Sellars who even refers to his philosophy as “*Meditations Hegeliennes*” (Sellars 1997: 45). The senses, for Peirce, are not empirically intuitive, they provide no given, but rather are always abductively inferential, even though they *feel* intuitive and immediate. As Peirce writes in “Pragmatism as the Logic of Abduction”, we find that “abductive inference shades into perceptual judgment without any sharp line of demarcation between them; or in other words our first premisses, the perceptual judgments, are to be regarded as an extreme case of abductive inferences, from which they differ in being absolutely beyond criticism” (EPII: 227). The abductions in perception feel like intuitions because they are unconscious, and because they are entirely beyond our self-control; they are not subject to logical criticism (EPII: 227). Now Peirce still holds his Aristotelian position that there is nothing in the intellect not first in the senses, but that does not render him as holding anything like a modern or traditional empiricist view of sensation. Rather, Peirce holds that there is nothing in the intellect not first in the sensation, because there is nothing to separate the intellect from the sensation in the way of a facultative separation (in contrast to Kant who does separate the faculties of intellect and sensation). Both the intellect and the sensation operate according to the logic

of abduction, while abductions of the intellect are subject to self-control, and those of the sensations not, and this logic of abduction Peirce also derives from Aristotle's *Prior Analytics* II.25 (as Peirce writes in "Three Normative Sciences", EPII: 205). In fact, Peirce conceives the abductive intellect to permeate the sensation, thereby making the sensation part of the intellect, which, again, makes Peirce's empiricism look like an idealism, in particular, like Hegel's idealism.

But despite his Hegelianism, Peirce in "An American Plato: Review of Royce's *Religious Aspect of Philosophy*" distinguishes his view from Hegel by recognition of the category of secondness, the category of the phenomena of struggle and reaction, the feeling that something is resisting our own ideas.

The capital error of Hegel which permeates his whole system in every part of it is that he almost altogether ignores the Outward Clash. Besides the lower consciousness of feeling and the higher consciousness of nutrition, this direct consciousness of hitting and of getting hit enters into all cognition and serves to make it mean something real. (EPI: 233).

According to Peirce, Hegel neglects secondness, which is the outward clash, and which is one of Peirce's three categories: firstness (feeling), secondness (reaction), and thirdness (representation). Peirce holds that this feeling of resistance that we get in all experience is a direct experience of reality: "That is what we mean by 'reality.' It is the brute irrational insistency that forces us to acknowledge the reality of what we experience, that gives us our conviction of any singular" ("Scientific Metaphysics", CP 6.340).

But this element in Peirce's philosophy is not so simple either, since Peirce sometimes recognizes that secondness is not sufficient to prevent idealism. In "On Phenomenology" Peirce explains that the distinction between the inner and outer worlds is that we can make modifications to the inner world, while the outer world offers resistance. But even this distinction is relative, since inner objects offer resistance, too, while outer objects can be somewhat modified (EPII: 151; see also Hausman 1997: 167). Furthermore, secondness is also not sufficient to keep Peirce from idealism because secondness is not cognized: thirdness is the only cognized category, while firstness and secondness must be prescinded from experience. Secondness is brute force and brute irrationality, and thus not sufficient to direct the inquirer in her thinking. The feeling of resistance cannot by itself tell us *about* the external world even if it indicates that there *is* an external world. In other words, secondness (by itself) is not sufficient as a self-corrective, which is what is needed for our many flowing abductive and erroneous inferences. So, perhaps secondness will not actually answer the empiricism question, as Peirce thought it could. Empiricism does not depend on how we feel or experience the external world, but on how experience

teaches us about the external world. Any empiricism depends upon not just whether the world acts upon us, but whether and how it acts on us such that we can learn from experience, such that experience can affect cognition.

But in the “On Phenomenology” passage (in the epigraph quotation), Peirce claims that experience is our teacher, and there, rather than pointing to secondness in general, he points to the peculiar experience of surprise when he articulates how experience teaches us: “It takes place by a series of surprises”. In the same essay, Peirce again highlights how surprise teaches the mind about the world: “It is by surprises that experience teaches all she deigns to teach us” (EPII: 154). The experience of surprise is the place where experience impacts the “flood of false notions”, which flow from the “springs in the soul”. Surprise is marked by the category of secondness, but surprise is a unique experience, since (more than merely indicating our contact with the world) through surprise we are forced to recognize our contact with the world, such that it influences our epistemic endeavors. This means that surprise can serve as a self-corrective in inquiry, since we investigate our surprises. As Jaime Nubiola writes in “Abduction or the Logic of Surprise” (*Semiotica*), it is “Peirce’s thesis that the trigger of all genuine research is surprise” (Nubiola 2005: 124). The human mind originates ideas by the logic of abduction, but these abductions begin, according to Peirce in his formulation of the logic of abduction, in “Pragmatism as the Logic of Abduction”, as responses to surprises. When someone discovers through surprise an error in one of her beliefs, then she responds to this problem by making another abduction, and carries on typically until she is surprised again (and the new abduction similarly breaks down).

Peirce in “On Phenomenology” describes the phenomenon of surprise as based in expectation, and then the thwarting of that expectation.

Your mind was filled [with] an imaginary object that was expected. At the moment when it was expected the vividness of the representation is exalted, and suddenly when it should come something quite different comes instead. I ask you whether at that instant of surprise there is not a double consciousness, on the one hand of an Ego, which is simply the expected idea suddenly broken off, on the other hand of the Non-Ego, which is the Strange Intruder, in his abrupt entrance. (EPII: 154).

The experience of a double consciousness in surprise between the ego (with the expected idea), and the idea suddenly broken off by the non-ego, gives the experience of surprise cognitive content, thereby suggesting a problem for the mind to solve through abduction. This is how surprise constrains our abductions. It lets us know when we are wrong. If we did not have this experience of surprise, which is outside our control, we would not have a self-corrective for our ideas, and experience would not be our teacher at all.

Peirce's view of experience does not amount to mere "distal stimuli", like that of Donald Davidson in *Subjective, Intersubjective, Objective* (Davidson 2004: xv & 88) because the experience of surprise has cognitive content (i.e., surprise is always *about* something in particular) sufficient to correct our "flood of false notions" (see Cooke 2011). But experience does not take place on the *tabula rasa* of modern empiricism either, as Peirce writes in "On Phenomenology" (in the epigraph quotation), since our minds make abductions providing the expectations which are sometimes successful, and sometimes lead to surprising results. Whether this is sufficient to make Peirce an empiricist is up for debate, of course, since his entire empiricism seems to rest on error recognition, and our ability to guess correctly (see Hookway 1995: 222–229). Experience teaches us through trial and error, and one can easily see Peirce's influence on Karl Popper, who regards scientific progress as a series of conjectures and refutations, with the mind generating a "flood of false notions" to be tested against the world. For Peirce (and for Popper) experience is self-corrective rather than generative of new knowledge. So this puts Peirce in very close quarters with the idealists. And, for Peirce, this model describes not just science as trial and error, but also conscious thought as trial and error, which suggests a synthesis similar to Kant, with the mind as passively receptive in the sensation, and spontaneously active and constructive in the understanding. But, in contrast to Kant, Peirce's view of experience is wrought with error, such that it is constantly progressing, correcting and discovering, constantly seeking new ground, and this experience of error through surprise puts us in contact with the world. The mind, for Peirce, as for Kant, is active, but for Peirce it is in a constant state of re-evaluation of its epistemic situation. Experience is the teacher that makes us learn by doing, by guessing, by experimenting, and by coming up with our own questions, but she will only hint at her answers, and we will often be confused as to whether we actually have good ones. Experience teaches the mind about the world in a uniquely pragmatic way, one not quite idealist in Kant's sense, or Hegel's sense, and one not exactly empiricist in the traditional modern sense. In Kant, the mind is the teacher which imposes order on experience, without the world being available to the mind, while in Hegel the mind instructs itself to find itself continuous with the world, so that there is nothing entirely outside the mind, but in Peirce experience of the world teaches the mind to know the world and to know the mind itself, and to know the difference through surprise and error recognition.

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52 Peirce on Science, Practice, and the Permissibility of ‘Stout Belief’

If the captain of a vessel on a lee shore in a terrific storm finds himself in a critical position in which he must instantly either put his wheel to port acting on one hypothesis, or put his wheel to starboard acting on the contrary hypothesis, and his vessel will infallibly be dashed to pieces if he decides the question wrongly, Ockham’s razor is not worth the stout belief of any common seaman. For stout belief may happen to save the ship, while *Entia non sunt multiplicanda praeter necessitatem* would be only a stupid way of spelling Shipwreck. (CP 5.60, 1903).

The History of the Harvard Lectures

This quote comes from the second of Peirce’s 1903 Harvard Lectures, delivered on April 2, 1903. The lecture appears in the *Collected Papers* as a composite of drafts under the title ‘The Universal Categories’ (CP 5.41–5.65), though it was originally advertised under the heading ‘Phenomenology and the Doctrine of Categories’ (Turrisi 1997: 37). This was Peirce’s second set of public lectures in five years, following his 1898 Cambridge Lectures – both of which had been secured and supported financially by the efforts of William James. It is a great irony that much of the work Peirce undertook in the Harvard lectures that James arranged was the work of disambiguating his own pragmatism, or pragmaticism, from the variant popularized by James. Insofar as the lectures serve this function, they are a critical text in the history of American pragmatism.

Peirce’s efforts to distance himself from James’ own formulations of pragmatism were not lost on James, who thought the first lecture a disaster. He complained to Dickinson Seargant Miller that it ‘was a great disappointment’, and went so far as to remark ‘I doubt whether [Peirce] has any very distinct idea of where he is coming out with his pragmatism, himself’ (CWJ 10: 225). James had previously warned Peirce that he ‘may have to run away and miss [the] second lecture’ (CWJ 10: 213). It is just as well that James was not in the audience, for he later confessed to Peirce that he could not understand the content of the second lecture at all. Upon reviewing the text of the lectures after their completion, he told Peirce:

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They are wonderful things – I have read the second one twice – but so original, and your categories are so unusual to other minds, that, although I recognize the region of thought and the profundity and reality of the level on which you move, I do not yet assimilate the various theses in the sense of being able to make a use of them for my own purposes. . . . I get, throughout your whole business, only the sense of something dazzling and imminent in the way of truth—This is very likely partly due to my mind being so non-mathematical and to my slight interest in logic; but I am probably typical of a great many of your auditors—of the majority, so my complaint will be theirs. You spoke of publishing these lectures, but not, I hope *tels quels*. (CWJ 10: 257–8).

Peirce was disappointed by James' recommendation that he not publish he lectures as is. In a letter to Christine Ladd-Franklin, he reports his talks at Harvard, saying 'I had intended to print them; but James said he could not understand them himself and could not recommend their being printed' (Ladd-Franklin 1916: 720).

Fortunately, we do now have a '*tels quels*' edition of Peirce's Harvard lectures – that is, an edition which presents precisely the versions of the lectures James found so incomprehensible. Patricia Ann Turrisi's 1997 edited collection of the Harvard Lectures is an important contribution, as her presentation includes not only the versions of the lectures which Peirce actually used in his presentations, but also the collected drafts of each lecture. That Peirce worked through his ideas with such intensity on this occasion – there are five extant drafts of lecture two alone – allows us to see how concerned Peirce was to make good use of the opportunity to publicly declare his philosophy.

Occam's Razor & The Common Seaman

The quote selected here is interesting partly for the reason that it seems at odds with Peirce's declared project of putting some distance between himself and James. The attentive reader will wonder immediately whether the seaman Peirce describes in this passage is in what James would call a genuine option case – a choice between two hypotheses which is 'living', 'forced', and 'momentous' (1979 [1896]: 14). Certainly, Peirce gives the seaman two live hypotheses: put the wheel to port, or put the wheel to starboard. The situation is forced, since the seaman is in a 'critical position'. And the choice is certainly momentous, since a wrong choice will leave the vessel 'dashed to pieces'. On the surface, this is precisely the sort of case where James thinks it is epistemically permissible to form a belief ahead of the evidence.

This interpretation may seem tempting, but cannot be sustained. Peirce was exceedingly harsh in his estimation of 'The Will to Believe', initially telling

James that his voluntarism may be 'ruinous in practice' (CP 8.251). Nor does his view soften as the years go by – he later remarks that it is a shame that James' philosophy became 'infected' with 'such confusions of thought as that of active willing . . . with willing not to exert the will (willing to believe)' (CP 6.485).

In light of strong evidence that Peirce is not advocating a Jamesian position here, we must seek a more plausible interpretation. The context in which this passage occurs is crucial: what Peirce is expounding on in the second Harvard lecture is the parsing of phenomenal experience into his three categories, each of which he diagnoses as present in everything that comes before the mind. Peirce introduces the seaman early in his discussion of the category of Thirdness, that which involves interpretation and signification of the Firstness and Secondness of experience: its 'pure' quality, and the way in which we find ourselves 'bumping up' against it (CP 1.303; CP 1.324). Peirce's central contention in this section is that nominalism is akin to the denial of Thirdness, of the element of judgment which he argues is present in all perception (CP 5.62; CP 5.116).

If we now re-engage with the selected quote, we can see that Peirce's message is that there is a time and a place to attempt nominalistic interpretation, such as that involved in the use of Occam's razor. The time is when there is nothing urgent upon us; the place is the laboratory. 'There never was a sounder logical maxim of scientific procedure than Ockham's razor . . . But you will mark the limitation of my approval of Ockham's razor. It is a sound maxim of *scientific procedure*'. In situations where one lacks the leisure and disconnection from results to try various logical maxims, 'the logic of the situation must take other factors into account'. Thus, the logic of the seaman's situation renders any attempt to use Ockham's razor 'a stupid way of spelling shipwreck' (CP 5.60).

Now, we begin to see how unlike James' view the position Peirce is taking here truly is. Far from this being an instance of Peirce adopting James' recommendations on epistemic procedure, this is actually an argument that cases like that of the seaman are not apt for philosophical consideration. Since Peirce conceives of philosophy as a theoretical science, he finds it simply not germane to 'matters of real practical concern', where 'we are all in something like the situation of that sea-captain'. In such cases, there is no point in pretending to be philosophical. One must act instead on 'stout belief' (CP 5.60). Whereas James would describe the seaman as forming and then acting upon an epistemically permissible belief, Peirce would describe him as acting on instinct.

Consider a very late passage where Peirce explains how 'stout beliefs', or beliefs born of instinct, arise: 'when one fact puts a person in mind of another, but related fact, and on considering the two together, he says to himself "Hah! Then this third is a fact' . . . it is by *instinct* that he draws the inference' (MS 682, 1913). What Peirce is pointing to is a Third, a perceptual judgment arising from

the consideration of the facts together – precisely that which he argued in the Harvard lectures is denied by nominalism. So we may say that the seaman instinctually infers that he ought to throw the rudder to port, but this is different from how James' will-to-believer operates in one critical way: Peirce's seaman does not pretend to be doing anything philosophical, or philosophically defensible. We may conclude that despite the superficial similarity of the seaman and James' genuine option cases, the gap between Peirce and James on this point is deep and wide.

What lies at the heart of this rich quotation is one of the greatest tensions of Peirce's architectonic: the divide between philosophy and practice. There is dispute about just how serious about that divide Peirce was, because he had a tendency when dealing with James to overstate the austerity of his own view in an attempt to counter what he saw as James' excesses. There is some question, as well, about how far Peirce's separation of philosophy and practice was actually meant to protect his sentimental conservatism about moral matters, rather than enshrine the ideals of science. There were hints late in Peirce's thought that he might overcome this divide, as when he tries to rehabilitate the possibility of a science of ethics by distinguishing it from mere 'practics', or practical conformity (CP 1.573). The tantalizing prospects of a properly normative science of ethics, organized under Peirce's *summum bonum* of the growth of 'concrete reasonableness', suggest that there may be a way of closing the gap that he presented so starkly in separation of the seaman and the scientist.

Mats Bergman beautifully articulates how such a project should proceed in his recent paper on Peirce on science and practice, where he asserts that we must attempt 'a balanced reconstruction of Peirce's approach' that embraces 'a conception of philosophy that on the one hand does not succumb to short-term demands for applicability, but which on the other hand fully recognizes the value of considering possible applications of abstract ideas – not merely as a secondary stage to be left in the hands of more practical inquirers and engineer, but as a substantial component in theoretical investigation itself' (Bergman 2010: 18). If we can respect the seriousness with which Peirce set out to articulate his own view while simultaneously repairing some of the damage done by the more rancorous expressions of it, we may begin to see this project through. A comprehensive study of the Harvard lectures building on the edition produced by Turrisi would be an excellent place to start.

Risto Hilpinen¹

53 Logic, Time, and Knowledge

Time has usually been considered by logicians to be what is called “extra-logical” matter. I have never shared this opinion. But I have thought that logic had not reached that state of development at which the introduction of temporal modifications of its forms would not result in great confusion; and I am much of that way of thinking yet. The idea of time really is involved in the very idea of an argument. But the gravest complications of logic would be involved, [if we took] account of time [so as] to distinguish between what *one knows* and what one *has sufficient reason to be entirely confident of*. The only difference, that there seems to be room for between these two, is that what one *knows*, one always will have *reason to be confident of*, while what one now has ample reason to be entirely confident of, one may conceivably in the future, in consequence of a new light, find reason to doubt and ultimately to deny. Whether it is really possible for this to occur, whether we can be said truly to have sufficient reason for entire confidence unless it is manifestly impossible that we should have any such new light in the future, is not the question. Be that as it may, it still remains *conceivable* that there should be that difference, and therefore there is a difference in the *meanings* of the two phrases. (CP 4.523, 1903).

Knowledge, truth, and justified belief

On the basis of Peirce’s statements about truth as the opinion “ultimately agreed to by all who investigate” (CP 5.407; CP 3.432) or “as the predestined result to which sufficient inquiry would ultimately lead” (CP 5.494; CP 8.41), it might be suggested that in this passage the distinction between having “sufficient reason to be entirely confident of” the truth of a proposition *h* and knowing that *h*, is simply the distinction between fully or adequately justified belief and adequately justified *true* belief. However, if we take the “final opinion” to be a proposition accepted at the end of inquiry as an answer to a question, such an opinion may already have been, and probably has been reached on “a vast multitude” of questions (CP 8.43). An individual opinion at any given time may “chance to coincide” with the settled final opinion (CP 7.336 n. 11), and such an individual opinion may conceivably in the future become subject of doubt on the basis of new evidence, even though the inquirer’s earlier confidence in its truth was amply justified by her evidence at that time. According to Peirce’s characterization of knowledge, under such circumstances the inquirer cannot be said to have known that *h*.

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According to this interpretation of the passage, knowledge-claims are forward-looking, and entail the prediction that future evidence will not undermine the claim. Knowledge differs in this respect from true beliefs which are fully justified within the inquirer's current belief system. This feature of the concept of knowledge has been expressed by different philosophers in different ways. For example, according to the thirteenth-century philosopher Siger of Brabant, a person who knows something should be able to defend her view successfully against objections:

Finding truth presupposes the ability to solve any objection or dubitation against the proposition accepted as true. For if you do not know how to solve the objections that may arise, you are not in possession of the truth, since in that case you have not assimilated the *procedure of finding truth* and thus will not know whether or when you have arrived at truth. (Kenny & Pinborg 1982: 27 & 27–28 n. 39).

Siger's condition is forward-looking; it refers to what an inquirer is able to do in the future, and if it is satisfied, she will always have "reason to be confident of" the truth of what she claims to know. In the same way, according to Jaakko Hintikka (1962: 20–21), the assertion that one knows that *h* expresses the conviction that new information or evidence would not lead one to change one's view. Under such circumstances the evidence for the proposition *h* can be said to *empirically* conclusive, even though it usually cannot be logically conclusive. This condition may be called the *extendability condition* of knowledge. Peirce's observation can also be expressed by saying that true knowledge-claims should be indefeasible and that genuine knowledge consists of stable beliefs which cannot be lost simply as a result of learning something new (Hilpinen 1988: 166–167). If new evidence forces an inquirer to withdraw a previously justified knowledge-claim that *h*, we should say that she did not know that *h*, even if *h* was true.

Epistemic logic and time

If knowledge-claims are forward-looking, and involve a prediction about what one may learn in the future, the logic of knowledge (epistemic logic) is an area of logic where the "introduction of temporal modifications of logical forms" is helpful or necessary, as suggested by Peirce in the passage quoted above. The so-called "paradox of knowability" or "Fitch's paradox" serves as an example of such necessity (Fitch 1963; Hilpinen 2004; 160).

Peirce seems to accept a version of the view that any true proposition can (in principle) be known to be true: “An unknowable reality is nonsense”. (CP 8.43; see also CP 3.432). This thesis may be formulated as a *pragmatic principle of knowability*:

(PrgPK²) If h is true, then a sufficient inquiry into the question whether h would ultimately make it known that h ,

which some logicians and epistemologists have expressed by the simple modal formula:

(1) $h \rightarrow \mathbf{MK}h$,

where ‘ \mathbf{M} ’ is an appropriate possibility operator, and ‘ $\mathbf{K}h$ ’ means that h is known or that the inquirer knows that h . (cf. Lindström 1997, 184–185; Hilpinen 2004: 159–160).

However, this formulation of the principle of knowability entails that there is no ignorance, that is, there is no true proposition g such that $\neg \mathbf{K}g$. The formula

(2) $(g \ \& \ \neg \mathbf{K}g) \rightarrow \mathbf{MK}(g \ \& \ \neg \mathbf{K}g)$

is a substitution instance of (1). If g is a true proposition not known to be true, in other words, if the antecedent of (2) is true, then its consequent is also true:

(3) $\mathbf{MK}(g \ \& \ \neg \mathbf{K}g)$,

which entails

(4) $\mathbf{M}(\mathbf{K}g \ \& \ \mathbf{K}\neg \mathbf{K}g)$,

and consequently (according to the principle that knowledge entails truth) the logically false proposition

(5) $\mathbf{M}(\mathbf{K}g \ \& \ \neg \mathbf{K}g)$.

Thus (1) is inconsistent with the assumption that there is ignorance, that is, (1) entails that all truths are knowable only if everything is already known. What can be is reduced to what is.

It is obvious that one cannot know that g and *at the same time* (or on the same occasion) know that one does not know that g . Fitch’s paradox shows that the modal formula (1) is not an adequate representation of the principle of knowability, and it is easy to see why. The principle of knowability states any truth h *can* be known, which should be taken to mean that it is possible for an inquirer *to come to know* (learn) that h as a result of sufficient inquiry, which is not synonymous with ‘It is possible *that* it is known that h .’ If g is a true proposition not known to be true, the pragmatic principle of knowability entails that an inquirer should be able to *come to know* that g and also come to know that

2 Abbr. Pragmatic Principle of Knowability

she *did not* know earlier (on a different occasion) that g . The time of the inquirer's ignorance must differ from the time of her knowledge of her ignorance. Thus an acceptable formal representation of the principle of knowability requires (to use Peirce's words) "the introduction of temporal modifications of [the] forms" of epistemic logic, that is, temporal indexing of epistemic operators. In this way the possibility of an inquirer's knowledge of her former ignorance about a true proposition g can be represented by the formula

(6) $\mathbf{MK}[t_2](g \ \& \ \neg\mathbf{K}[t_1]g)$,

where g represents a temporally definite (complete) proposition, and ' $\mathbf{K}[t]g$ ' means that it is known at time j (on occasion j) that g . (6) entails

(7) $\mathbf{M}(\mathbf{K}[t_2]g \ \& \ \mathbf{K}[t_2](\neg\mathbf{K}[t_1]g))$,

which is not inconsistent. Here t_1 precedes t_2 , or t_2 may be thought of as a situation which an inquirer (an individual or a community) can reach from t_1 by means of her knowledge-seeking activities.

The pragmatic principle of knowability is not logically inconsistent, even though it may fail to be true for contingent reasons, for example, because the cognitive resources available to the community of inquirers are not unlimited. An inquiry into the truth of a proposition g is apt to change the world, and render false some propositions which would have been true in the absence of the inquiry. Thus it may happen that it is possible to come to know that g and also possible to come to know the truth of another proposition f , but not both, because an inquiry into the question whether g is true may make it impossible to know that f . In such a case we might say that g and f are *distributively* knowable (Hilpinen 2004: 164–165; Restall 2009: 353–354).

Acknowledgment

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Tony Jappy¹

54 The Hypoicons

Hypoicons may be roughly divided according to the mode of Firstness of which they partake. Those which partake of simple qualities, or First Firstnesses, are *images*; those which represent the relations, mainly dyadic, or so regarded, of the parts of one thing by analogous relations in their own parts, are *diagrams*; those which represent the representative character of a representamen by representing a parallelism in something else, are *metaphors*. (CP 2.277, 1903).

Introduction

No doubt none of the chapters in this book would ever have been conceived let alone published had the Collected Papers never been collated and made available by editors Hartshorne, Weiss and Burks. For this, then, we must all be thankful. However, despite their erudition, in their enthusiasm they consciously established sequences of paragraphs from differing dates and manuscript sources thereby providing researchers with potentially misleading data. Paragraph 2.277, which defines the hypoicons, is one such case.

The present chapter, therefore, examines paragraph 2.277 in the light of its complex editorial genealogy, attempts to establish its importance within the Peirce canon and assesses its value as a logical, that is, semiotic, concept. Given the concise and uncompromising nature of the definition, the chapter also attempts to explain the way Peirce established it and what it means, and also its reception by researchers working within the field of linguistics.

1 The editorial issue

The intellectual context of CP 2.277 is to be found in two drafts of Peirce's late 1903 Lowell Lectures, namely MS 478 and MS 540, which represent two distinct and complementary approaches to the definition of the sign. MS 540 identifies more fully the three correlates of any triadic relation whereas MS 478 first describes the categories and the various processes of separation, including precision (EPII: 270–1), and uses them to define the sign and two trichotomies. Chapters 20 and 21 in EPII reproduce the drafts chronologically and show how Peirce was working towards a coherent theory of the sign to be presented in the

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lectures. On the other hand, extracts from the two manuscripts are reproduced unchronologically in Book II, ‘Speculative Grammar’, of Volume 2 of the Collected Papers.

The divergences between the redistributed CP version and the two consecutive chapters in EPII are striking. For example, extracts from the later MS 540 were included in Chapter 2 of the Collected Papers, ‘Division of Signs’, while those of the earlier MS 478 introduce Chapter 3, entitled ‘The Icon, Index and Symbol’. This explains why CP 2.275 begins with an ellipsis. Peirce’s original formulation is as follows: “Representamens are divided by two trichotomies. The first and most fundamental is that any Representamen is either an *Icon*, an *Index*, or a *Symbol*” (EPII: 273), the first sentence of which was edited out of the Collected Papers. As explained in a note on EPII: 273, this initial ‘most fundamental’ trichotomy was subsequently replaced by the qualisign-sinsign-legisign trichotomy to be found in the Collected Papers in an earlier chapter.² It should be noted, too, that while the definition of the three hypoicons concludes a parent paragraph in the manuscript CP 2.277 appears as a separate, independent paragraph in the Collected Papers. Originally, then, what we know as CP 2.277 was simply the logical development of a trichotomy which was subsequently ‘post-poned’ to second position in Peirce’s 1903 triadic classification system.

Comparison of these two published editions of the same Lowell Lecture drafts shows, then, that the Collected Papers invert material from MSS 478 and 540, presumably aiming for thematic unity rather than chronological precision, and in doing so obscure a potential change of heart concerning the status of the second trichotomy and, concomitantly, that of CP 2.277. The implications for researchers are ominous, as the distinctions made by Peirce in this particular paragraph might be considered by the sceptical exegete as a theoretical flash in the pan, a concept introduced by Peirce during the initial formulation of his first really fully developed theory of signs only to be discarded when a more general conception came to mind. In what follows I plead for a more positive understanding of the hypoicons, working from internal and external evidence.

2 Theoretical considerations

Modes of representation

Just why Peirce should have considered the second trichotomy in 1903 as the ‘most fundamental’ is obvious. Since the sign represents an independent and

² The entry for MS 478 in the Robin catalogue gives a good idea of how the Syllabus drafts were redistributed, as do the editorial introductions to chapters 21 and 22 of EPII.

usually absent entity – its object – it follows that its mode of representation is of paramount importance for the identification of that object. Does this mean that this most fundamental division was ‘demoted’ when Peirce introduced the quali-sign-sinsign-legisign distinctions as the first trichotomy in the later manuscript? Clearly not. Peirce no doubt realized that the three possible subclasses of the sign itself had to be defined before he could define the three modes of representation in a logical manner. This became possible once the status of the sign within triadic relations was clearly established in the later manuscript, together with the degrees of complexity characterizing its three subclasses.

Now the sign had already been identified as first correlate in MS 478: “A Sign, or Representamen, is a First which stands in such a genuine triadic relation to a Second, called its Object, as to be capable of determining a Third, called its Interpretant, to assume the same triadic relation to its Object in which it stands itself to the same Object” (EPII: 272). This is the case, too, in the extract from MS 478 in which Peirce introduces the concept of the hypoicon:

An *Icon* is a Representamen whose Representative Quality is a Firstness of it as a First. That is, a quality that it has *qua* thing renders it fit to be a Representamen . . . But a sign may be *iconic*, that is, may represent its object mainly by its similarity, no matter what its mode of being. If a substantive be wanted, an iconic Representamen may be termed a *hypoicon*. Any material image, as a painting, is largely conventional in its mode of representation; but in itself, without legend or label it may be called a *hypoicon*. (CP 2.276; EPII 273–4).³

However, the ‘most fundamental’ division was a trichotomy mentioned almost half a century earlier in ‘A New List of Categories’, and it was probably the one which most clearly illustrated the categorial distinctions Peirce had introduced earlier in the draft, and the description of the icon as a First in a triadic relation with Firstness as its representative quality suggests that Peirce was anticipating at this point the more detailed material in MS 540. Given the three possible degrees of complexity of the sign, or ‘representamen’ as he called it then, he was finally able to justify logically the three modes of representation by means of the categories: namely, in order of decreasing complexity, by convention, by spatio-temporal contiguity and, finally, by resemblance.⁴ This latter Peirce had

³ Note that later in MS 478 Peirce offers a variant of the final clause of the definition: “and those which are icons in respect to their intellectual characters, being examples”. However, since metaphor is a figure and *figura* was the Latin rendering of Gr. σχῆμα, form, the various editors of the text have presumably decided that ‘metaphor’ was more appropriate in a subclass such as the icon, based as it is on formal considerations.

⁴ Resemblance is an identity of characters; and this is the same as to say that the mind gathers the resembling ideas together into one conception. (CP 1.365)

already defined as a relation of reason (CP 1.365; CP 4.3) and it partakes of the category of Firstness.

Three grades of resemblance

What of the hypoicons? Are we to assume that Peirce ‘pulled them out of his hat’ by chance as a one-off act of logical prestidigitation or as a passing afterthought to his fundamental division? Again, clearly not. No doubt if anyone had ever asked him in how many ways one entity can resemble another, Peirce would have roundly dismissed the idea that there was only one possible way. Indeed, we all know that he would have suggested three and that he would have obtained them by applying the same categorial principle which yielded symbol, index and icon recursively to the Firstness of the icon itself.

The trichotomy resulting from this recursive process is none other than the paragraph describing metaphor, diagram and image in order of decreasing complexity. Since MS 478 describes the categories in detail it comes as no surprise that these categories should be applied in the same manuscript to the sign-object relation and recursively to the icon, the most basic of the three subclasses thus derived. Furthermore, Peirce described his theory of separation in detail in this very same manuscript. This made it possible for him to state in the later manuscript that the index involves a sort of icon and the symbol a sort of index (EPII 291–2). Since the recursive application of the categories to the icon yields metaphor, diagram and image it follows by transitivity that symbols will involve an icon and, consequently, any of the three hypoicons.

Hypoicon and the medium

Peirce further defines the sign “. . . as anything which is so determined by something else, called its Object, and so determines an effect upon a person, which effect I call its Interpretant, that the latter is thereby mediately determined by the former” (SS 80–1). Variations in this generic ‘determination process’ in semiosis are represented as Figures 1–4, where some dynamic object mediately determines some interpretant by means of a sign whose structure that object has already determined, a sign which, depending upon the nature of the relation holding between it and its object, may be a symbol, an index or an icon. In what follows the sign is assumed to be an icon. The three ways in which the sign can resemble its object by virtue of Peirce’s categorial principle are represented by Figures 1, 2, 3 and 4, respectively generic image, diagram and metaphor and a concrete example of metaphor, while the arrows represent both the

process of determination and the passage of the sign through a ‘sensible’ medium.

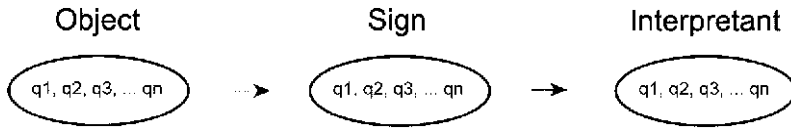


Figure 1: Generic image

Figure 1 is a very basic representation of the qualities – First Firstnesses – inhering in some object which determine corresponding qualities in a given sinsign. As Peirce suggests in a quotation given above, any painting illustrates the process: Leonardo’s Mona Lisa is a sinsign composed of qualities – lines, forms and colours – arranged in a distinctive manner.

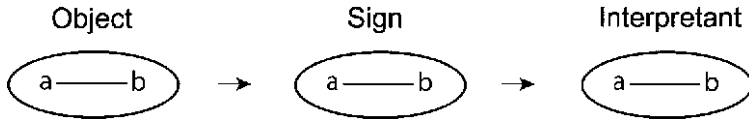


Figure 2: Generic diagram

Figure 2 represents the structure of a very simple diagram, an icon composed essentially of Second Firstnesses, namely the dyadic relations mentioned in the definition and represented as **a—b** on Figure 2, such relations being a step up from the First Firstnesses composing the image. The diagram is thus an icon of relations (CP 4.418), and structures all manner of instruments of measurement, the instructions for building kits or installing electrical appliances and the illustrations in geometry manuals, for example.

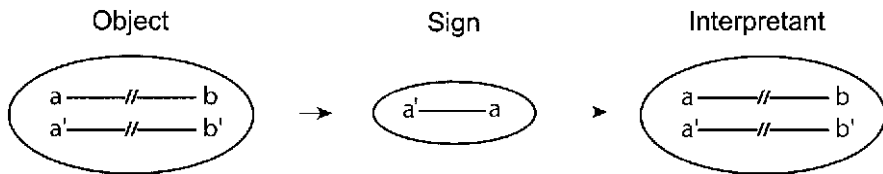


Figure 3: Generic metaphor

Finally, metaphor is the hypoiconic structure partaking of Third Firstnesses – mediation, synthesis, representation (see, for example, CP 1.378). Whereas the simplified schema of the diagram on Figure 2 contains a relation – some fact,

say, such as Cain killed Abel – metaphor as defined by Peirce places two relations in parallel (Figure 3).

It was Peirce’s genius that enabled him to see that there are signs more complex than the common diagrammatic type, signs which ‘synthesize’ in the guise of a judgement elements from two distinct relations – two facts such as *This man is untrustworthy* and *Foxes are cunning*, for example. However, this ‘two-tiered’ parallel structure is too complex to be accommodated fully by the Secondness of the medium through which it has necessarily to be communicated, and results in the vectorial metaphorical sign *This man is a fox* (see CP 7.590). This is the necessarily simplified situation represented as a phenomenological bottleneck on Figure 4, where the bracketed items in the parallelism are ‘sifted out’ by the less complex medium which in this way restricts the perceivable form of the sign.

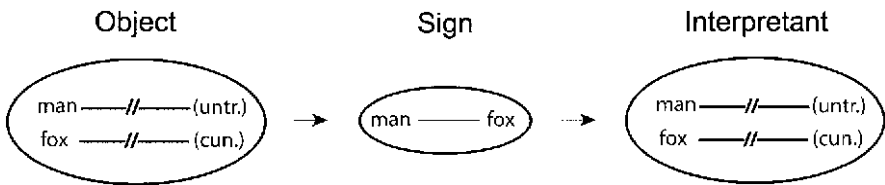


Figure 4: The metaphorical structure of “This man is a fox”

Now the process of drawing together two facts and placing them in parallel is dependent upon someone having seen a resemblance between them – a rhetorical decision – and CP 2.277 turns out to be pivotal between speculative grammar, in which it is defined, category theory on which the definition is based, and speculative rhetoric, which enables us to understand where the parallelism in metaphor, for example, comes from. Moreover, this complex situation is an ecological one, involving the sign and its environment, more precisely the three distinct relations holding between an iconic sign and the medium through which it is communicated. CP 2.277 can therefore be understood as the logical accommodation of this complex ecological situation.⁵

3 ‘Explanatory adequacy’

One consequence of the editors’ having separated CP 2.277 from its parent paragraph was that it acquired a prominence it would not otherwise have had, which

⁵ See chapter five of Jappy (2013) for a fuller discussion.

suggests that they must have understood or somehow divined the originality of Peirce's sub-iconic trichotomy. And in this prominent guise it was noticed by one Roman Jakobson and turned into a theory of linguistic motivation at a time when Chomskyan linguistics was threatening to impose rationalist generative orthodoxy and the arbitrariness of the verbal sign. Jakobson's 'Quest' article (Jakobson 1965) effectively introduced Peircean semiotics to linguists at large and laid the foundations of a theory of linguistic iconicity. This led to theoretically viable research on submorphemic qualitative distributions and phonotactics based on image and diagram (e.g. Pharies 1985) and to the study of 'natural' syntax and *ordo naturalis* based upon the diagram (e.g. Haiman 1985).⁶ The paragraph's 'explanatory adequacy', to cite a mid-Sixties linguistic buzzword, namely its capacity to accommodate the raw linguistic data, was soon established and is now seen to apply universally to semiotic data both verbal and non-verbal.

CP 2.277 thus provides a general framework for research into the motivation of language signs (cf. EPII 408) and constitutes a classic example of how cenoscopic principles – in Jakobson's case from speculative grammar – supply a special 'idioscopic' science such as linguistics with its basic principles. For although iconicity theory is but a subsidiary branch of linguistics, the net result of Jakobson's 1965 paper, largely based as it is upon the principles set out in CP 2.277, is that there is no longer any doubt that linguistic signs are motivated: he was able to bring about a change of perception concerning the relation between a linguistic sign and what it represents using principles established in speculative grammar.

Unfortunately, owing no doubt to a conflict with his own theory of the metonymical and metaphorical poles of language, Jakobson omitted to mention Peirce's third hypoicon, metaphor. And yet this is important for several reasons. It explodes the myth of language as a code, a system of sound-meaning correspondences: as the structure of metaphor on Figures 3 and 4 shows, some signs, verbal and non-verbal, are less complex than the objects they represent, and frustrate any attempt to find a direct sound-meaning correspondence. Moreover, CP 2.277 anticipates the conceptual metaphor movement following Lakoff and Johnson (1980) and its modern avatar, blended space theory, by three quarters of a century. And although Peirce never fleshed out his conception of metaphor or identified its constituents, identifiers such as 'source domain' and 'target domain' apply easily to the two parallel relations involved in metaphorical structure as defined in the paragraph.

Finally, by showing in logical terms that metaphor was the most complex of three hypoicons Peirce effectively removed it from the ghetto of traditional

⁶ See Jappy (1999) for a discussion and references.

rhetoric theory; and since the rheme-dicent-argument trichotomy inherits structure from the trichotomy preceding it, it follows that rhemes can be structured by shared qualities, by relation-reaction and by mediation/synthesis/representation. This being the case, both dicent and argument also partake of such formal properties. And indeed CP 2.277 contains in metaphor a structural blueprint for syllogism and inference.

Conclusion

CP 2.277 defines the three basic ways in which any sign can represent its object by resemblance and at the same time explains how some signs are less complex than the medium through which they are transmitted, how some share the medium's complexity and how others, owing to the restrictions imposed by a less complex medium, manage to represent an object far more complex than themselves. Far from being a flash in the pan, the paragraph turns out to be a flash of logical genius, and to their credit the editors of the Collected Papers seem to have recognized this.

Lihua Zhang¹

55 The Phenomenon of Reasoning

The phenomena of reasoning are, in their general features, parallel to those of moral conduct. For reasoning is essentially thought that is under self-control, just as moral conduct is conduct under self-control. Indeed reasoning is a species of controlled conduct and as such necessarily partakes of the essential features of controlled conduct. If you attend to the phenomena of reasoning, although they are not quite so familiar to you as those of morals because there are no clergymen whose business it is to keep them before your minds, you will nevertheless remark, without difficulty, that a person who draws a rational conclusion not only thinks it to be true, but thinks that similar reasoning would be just in every analogous case. If he fails to think this, the inference is not to be called reasoning. (EPII 249; CP 1.606, 1903).

We are rational beings only because we can reason. When an ordinary man wants to know what reasoning is, he will appeal to logic textbooks in our universities, for logic is usually seen as the normative science about how we should reason. Unfortunately, most of what he finds is not the analysis of reasoning itself, but the calculus of algebraic formulas. And when he further asks where the theory of reasoning is, the reply is that “the calculus of well-formed formulas is just the theory of reasoning”. Being different from the popular approach to logic as the theory of reasoning, Peirce, in a lecture delivered in 1903, “What Makes a Reasoning Sound?”, especially the above quotation from it, speaks of reasoning as phenomena in our life, thus giving us something more pertinent and more interesting about the nature of reasoning. Though the terminology “the phenomena of reasoning” is used only a few times in the *Collected Papers* as well as in *The Essential Peirce*, the main points about the phenomena of reasoning and the theory of reasoning were emphasized by Peirce again and again in his many writings from the early to the late period. Considering Peirce’s architectonic philosophy, we can and should read the following three insights from the quotation.

Firstly, reasoning as phenomenon is essentially thought that is under self-control. According to Peirce’s classification of sciences:

Phenomenology treats of the universal Qualities of Phenomena in their immediate phenomenal character, in themselves as phenomena. It, thus, treats of Phenomena in their Firstness. Normative Science treats of the laws of the relation of phenomena to ends; that is, it treats of Phenomena in their Secondness. (EPII: 197).

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Logic, as one of three normative sciences, concentrates on the phenomenon of reasoning, in which “end” is Truth, as contrasted to Right in ethics and Beauty in aesthetics. Insofar as the phenomenon of reasoning always has its end to conform to, that is, “a person who draws a rational conclusion not only thinks it to be true, but thinks that similar reasoning would be just in every analogous case” (CP 1.606) we can say reasoning is a kind of self-controlled action, for an end is germane to self-controlled action.

Reasoning, properly speaking, cannot be unconsciously performed. A mental operation may be precisely like reasoning in every other respect except that it is performed unconsciously. But that one circumstance will deprive it of the title of reasoning. For reasoning is deliberate, voluntary, critical, controlled, all of which it can only be if it is done consciously. An unconscious act is involuntary: an involuntary act is not subject to control; an uncontrollable act is not deliberate nor subject to criticism in the sense of approval or blame. A performance which cannot be called good or bad differs most essentially from reasoning. (CP 2.182).

This characterization of reasoning excludes some so-called “thinking” that cannot be controlled, such as intuition, from genuine reasoning, and also debars all the activities which pretended to be reasoning but do not have truth as their end. In an unpublished work titled “Short Logic” from 1895, Peirce thus defines reasoning:

Reasoning is the process by which we attain a belief which we regard as the result of previous knowledge. . . . a given belief may be regarded as the effect of another given belief, without our seeming to see clearly why or how. Such a process is usually called an *inference*; but it ought not to be called a *rational inference*, or *reasoning*. (EPII: 11–12).

In a still earlier manuscript from 1873, Peirce had recognized that reasoning as self-controlled thought must be the real inquiry from doubt to belief. He writes:

A man begins to inquire and to reason with himself as soon as he really questions anything and when he is convinced he reasons no more. Elementary geometry produces formal proofs of propositions which nobody doubts, but that cannot properly be called reasoning which does not carry us from the known to the unknown, and the only value in the first demonstrations of geometry is that they exhibit the dependence of certain theorems on certain axioms, a thing which is not clear without the demonstrations. (CP 7.322).

In contemporary research on theory of reasoning, Gilbert Harman’s characterization of reasoning as “reasoned change in view”² comes close to Peirce’s view.

² See Harman, Gilbert (1989).

On the other hand, this makes something that is sometimes outside of the concern of many logicians, such as induction or abduction, to be genuine reasoning. Because:

by '*Reasoning*' . . . be meant any change in thought that results in an appeal for some measure and kind of assent to the truth of a proposition called the '*Conclusion*' of the reasoning, as being rendered '*Reasonable*' by an already existing cognition (usually complex) whose propositional formulation shall be termed the '*Copulate Premiss*' of the reasoning" . . . "no feebleness in the recommendation that a reasoning offers for trust in its conclusion will prevent its being called a 'reasoning' . . . If an acknowledged fact only makes a conclusion to be thought a little less inadmissible rationally than it would have been but for that fact, the passage from the fact to this acknowledgment is a 'reasoning', according to this definition". (EPII 454–455).

Therefore, even though abduction merely suggests something, and much less in surely than deduction, it is entitled to a kind of reasoning.

Secondly, logic as the theory of reasoning relies on ethics as "the study of what ends of action we are deliberately prepared to adopt" (CP 5.130) As to the judgment that reasoning is a species of controlled conduct, Peirce's similar or further remark is, "a logical reasoner is a reasoner who exercises great self-control in his intellectual operations; and therefore the logically good is simply a particular species of the morally good" (EPII 200–201). However, this is not all the relevance of ethics to logic. In a more important aspect, the element of end is essential to the phenomenon of reasoning, so logic must rely on ethics, the fundamental problem of which is "What am I prepared deliberately to accept as the statement of what I want to do, what am I to aim at, what am I after?". "Now logic is a study of the means of attaining the end of thought. It cannot solve that problem until it clearly knows what that end is. Life can have but one end. It is Ethics which defines that end. It is, therefore, impossible to be thoroughly and rationally logical except upon an ethical basis" (CP 2.198). Peirce illuminates the point with his personal experience as a logician: "Before my logic was brought under the guidance of ethics, it was already a window through which much important truth could be seen, but dim with dust, distorting details by striae. Under the guidance of ethics I took it and melted it down, reduced it to a fluid condition. I filtered it till it was clear. I cast it in the true mould; and when it had become solid, I spared no elbow-grease in polishing it. It is now a comparatively brilliant lens, showing much that was not discernible before" (CP 2.198).

Of course, in a lot of literature nowadays, logic seems to rely more on mathematics than on ethics. But Peirce has reason to insist on his own position.

There is a mathematical logic, just as there is a mathematical optics and a mathematical economics. Mathematical logic is formal logic. Formal logic, however developed, is mathematics. Formal logic, however, is by no means the whole of logic, or even its principal part. It is hardly to be reckoned as a part of logic proper. Logic has to define its aim; and in doing so is even more dependent upon ethics, or the philosophy of aims, by far, than it is, in the methodetic branch, upon mathematics. (CP 4.240).

Moreover, perhaps unknown and surprising to many contemporary logicians, but worthy of noting here, another founder or sometimes *the* founder of modern logic, G. Frege, also claimed the priority of ethics as normative science. In an essay composed in 1897, Frege wrote:

When entering upon the study of a science, [w]e want to have in sight a goal to strive towards; we want some point to aim at that will guide our steps in the right direction. The word 'true' can be used to indicate such a goal for logic, just as can 'good' for ethics and 'beautiful' for aesthetics. . . . Like ethics, logic can also be called a normative science. How must I think in order to reach the goal, truth? We expect logic to give us the answer to this question . . .³

Thirdly, logicians should study the phenomena of reasoning in a coenosopic or philosophical way. Peirce reminds us to “attend to the phenomena of reasoning” in order to understand what the key is to reasoning, and this points to a unique way in doing logic and other divisions of philosophy. Peirce clarified matters:

. . . by Philosophy I mean that department of Positive Science, or Science of Fact, which does not busy itself with gathering facts, but merely with learning what can be learned from that experience which presses in upon every one of us daily and hourly. It does not gather new facts, because it does not need them, and also because new general facts cannot be firmly established without the assumption of a metaphysical doctrine; and this, in turn, requires the cooperation of every department of philosophy; so that such new facts, however striking they may be, afford weaker support to philosophy by far than that *common experience* which nobody doubts or can doubt, and which nobody ever even *pretended* to doubt except as a consequence of belief in that experience so entire and perfect that it failed to be conscious of itself; just as an American who has never been abroad fails to perceive the characteristics of Americans; just as a writer is unaware of the peculiarities of his own style; just as none of us can see himself as others see him”. (EPII: 196).

That is to say, philosophy, on one side, is distinguished from mathematics, which is not a positive science; and on the other side, it is distinguished from the special sciences such as physics and psychology, which are not concerned with common experience. In this way, what philosophers should do is, first and foremost, to keep before our minds the common experience, especially that neglected, some-

³ Gottlob Frege (1979).

what like the job clergymen mostly has done in morals. For this distinctive observational method, Peirce preferred to call Philosophy with a new name from Jeremy Bentham, Coenoscopy (from two Greek words, one of which signifies *common*; the other *looking to*).

Coming to logic as a coenosopic science, logicians should closely look to the phenomena of reasoning in our everyday life, and base their results on these observational facts. Again, all thought being performed by means of signs, and all reasoning is in signs, so the cenoscopic study of reasoning is just semiotics or the science of the general laws of signs, which is Peirce's project of the whole range of logic.

It has three branches: 1, Speculative Grammar, or the general theory of the nature and meanings of signs, whether they be icons, indices, or symbols; 2, Critic, which classifies arguments and determines the validity and degree of force of each kind; 3, Methodeutic, which studies the methods that ought to be pursued in the investigation, in the exposition, and in the application of truth". (CP 1.191).

Douglas Niño¹

56 Peirce's Abduction

The surprising fact, *C*, is observed;
But if *A* were true, *C* would be a matter of course,
Hence, there is reason to suspect that *A* is true. (CP 5.189, 1903).

In the current literature about Abduction, the above quote from Peirce usually appears. In my opinion, in this “canonical statement of abduction” (CSA) three criteria for the identification of Peircean Abduction (and its distinction from Peircean Induction) are discernible. These criteria are formal, methodological and epistemic.

Concerning the *formal criterion* it can be argued that Peirce systematically understood Abduction as the inference from a consequent and a consequence to an antecedent (cf. W2: 46, 1867; W2: 58, 1867; W2: 219n, 1868; W3: 328, 1878; W4: 419, 1883; RLT: 139, 1898; RLT: 139, 1898; CP 5.189, 1903; NEM3: 205, 1911), and Induction as an inference to a consequence from an antecedent and a consequent (W2: 58, 1867; EPI: 188, 1878; W4: 416, 1883; NEM4: 357, 1894; RLT: 138, 1898; NEM3: 197, 199–200, 1911). This point is derived from Peirce’s analysis of the Aristotelian syllogism through the lens of the medieval theory of *consequentiae*, which originated the famous “Rule, Case, Result doctrine” (RCRd) for the three forms of inference, particularly known through the example of the bag of beans (CP 2.623, 1878). In RCRd, the Major premise is a *rule* which behaves as a *consequence* (in the medieval sense, that is to say, as a sequence in which a *consequent* follows from an *antecedent*); the Minor premise is a *case* which falls under or is governed by that *rule*, and in that sense behaves as an *antecedent*; and the *result* emerges from the application of the *rule* to the *case*, and for this reason the result is conceived of as a *consequent*. In CSA the first premise is the consequent, the second is the consequence and the conclusion is the antecedent (this also explains the selection of the letters “*A*” and “*C*” in CSA). Concerning Induction, Peirce adds that this was Aristotle’s theory (*Post. An.* II: 23), which in terms of the RCRd is the inference to a *rule*, as in the case in which we desire to determine the frequency of a certain color from a bag of beans and we draw a random sample from it (EPI: 188, 1878). However, Peirce also claimed that (qualitative) Induction was present in hypothesis verification. How does this formal structure fit in? Here’s my answer: First, Peirce very early adopted this Kantian Maxim: “if all the consequents of a cognition are true, the cognition itself is

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true” (W2: 219, 1868). Thus, once the hypothesis is obtained by Abduction, it should be developed, that is, different consequences should be *deduced*. Once those consequences are established, some have to be selected to be tested; and only then the experiment is carried out. In this sense, the logical form of (qualitative) Induction is:

Case:	<i>Antecedent:</i>	These consequences are drawn from this hypothesis
Result:	<i>Consequent:</i>	These consequences are true
Rule:	<i>Consequence:</i>	All the consequences of this hypothesis are true

And by the Kantian Maxim previously mentioned, this last *consequence* can be considered to establish (provisionally) that the original hypothesis is true. Moreover, this proposal explains Peirce’s own examples of qualitative Induction (e.g. HPPLS: 897–898, 1901).

Moreover, this formal criterion explains the different names Peirce used for Abduction. For instance, in 1864 (MS 744) and 1865 (W1: 180) Peirce uses “a posteriori reasoning”, because before Kant this expression meant reasoning from effect to cause, or more precisely, from consequent to antecedent (W1: 245, 1865). “Hypothesis” – used from 1866 until 1897 – is defined in this very manner (cf. e.g. W2: 219, 1868). “Retroduction” (used in 1898 and from 1906 until 1914) is constructed from the Latin *retro* – which means “go back”, as in “retrospective”–, meaning that in Abduction we ‘go back’ to the antecedent from a consequence, by additionally taking a certain proposition as its consequent. This use of “Abduction” is related to his conjecture that Aristotle’s “apagôgué” (*Post. An.*, II: 25) is what Peirce previously called Hypothesis or Retroduction, *granted that we would accept the conjecture* that Aristotle’s MSS on apagôgué were mistranscribed by Apellicon, and that it would be sufficient to change a mere word in them to make “apagôgué” have the same meaning as “Retroduction”, and therefore, to refer to the inference to an antecedent from a consequent. Peirce began to meditate on such a conjecture in 1894 (MS 397 & MS 398), and adopted it explicitly from 1900 until 1905, but eventually discarded it because he thought it was not well established (CP 8.208), and finally went back to use “Retroduction” until one month before his death, on March 15 (MS 752, ISP 5, 1914).²

Secondly, Peirce introduced *methodological* elements in his Logic very early (eg. W1: 175, 1865; W1: 420, 433, 1866; W2: 48, 1867), and in 1878 he stated that

² The use of “Presumption” has an anecdotic explanation: in the moment Peirce joined the *Baldwin Dictionary* project many entries have been written already and the edition had progressed until letter “E”. And as it is shown through L34, Peirce could not convince Baldwin of letting him use “Abduction”. Thus, when Peirce uses “Presumption” immediately adds that he prefers “Abduction” (CP 2.744).

“synthetic inference is founded upon a classification of facts, not according to their characters, but according to the manner of obtaining them” (W3: 305; cf. CD: 3081, 1889; MS 766: ISP4, 1896). It seems to me that Peirce included some methodological features in both his Abduction and Induction, in the framework of his doubt-belief model of fixation of belief. Concerning Abduction, I think that in the first premise of CSA the ‘surprising’ factor is related with the claim that we must start an inquiry in virtue of a genuine doubt (cf. W2: 212, 1868; W3: 247, 1878). We are compelled to abduce when we don’t know either how to explain or to do something, otherwise Abduction is not required. In this sense, the facts which give origin to Abduction are not looked for, but present themselves to our experience, and the methodological role of the first premise of CSA is, in this sense, twofold: first, to make explicit that something must be solved (cf. W3: 326, 1878); and second, that we have to entertain the facts found as our first abductive premise. Concerning Induction, Peirce even *defined it* in a *methodological* manner in 1878:

The inference that a previously designated character has nearly the same frequency of occurrence in the whole of a class that it has in a sample drawn at random out of that class is induction. If the character be not previously designated, then a sample in which it is found to be prevalent can only serve to suggest that it may be prevalent in the whole class. We may consider this surmise as an inference if we please – an inference of possibility; but a second sample must be drawn to test the question of whether the character actually is prevalent. (W3: 313, 1878; Peirce’s emphasis).

From this definition we see that Induction requires predesignation and sampling. By predesignation we establish before the observation which characters are going to be tested. Sampling is understood as usual. In this sense, predesignation and sampling answer *what* and *where* we must look for in Inquiry. And as it is asserted in the quote, if predesignation is overlooked, the inference becomes hypothetical or abductive: it is a “surmise”. Peirce retains these rules from 1878 until 1911³. But in 1898 Peirce introduces Induction as the third stage of Inquiry, and by 1911 he affirms that we must be suspicious of an Induction if it is not preceded by an Abduction (L231: ISP21; NEM3: 178). This means that Induction is literally the third stage of inquiry, also methodologically; being this “precession” requirement a third rule.

³ cf. W3: 313, 1878; MS 747: ISP 26, 1881; W4: 427, 434; 435, 436–438; 1883; CD: 4682, 1889; CP 6.41–42, 1892; NEM4: 357, 1894; RLT: 136–138, 171–172, 194–195, CP 1.96, 1898; MS 1147A: ISP97, c.1900; CP 2.784; 2.789–790, 7.209, 1901; CP 7.120, 1903; MS 842: ISP161, 1908; CP 8.234, 1910; NEM3: 178, 194–195, 1911.

These rules have, on one hand, a proscriptive role: they prevent the introduction of subjective elements in reasoning, as the examples of poets (W3: 313, 1878; W4: 435, 1883) and biographies (CP 1.96, 1898) show. On the other hand, they have a prescriptive character: Induction requires sampling, predesignation, and precession, with predesignation playing a pivotal role, because without it, Induction becomes Abduction (W3: 313, 1878; MS 842: ISP161, 1908). This point has a crucial consequence: given that in Abduction what is empirically found is not looked for, but in Induction it must be deliberately looked for (predesignation) and founded (sampling), the facts stated in the first premise of Abduction do not count as evidence for Induction.

Thirdly, there is an *epistemic* criterion. Notice that the ‘surprise’ of CSA’s first premise testifies an epistemic state: our ignorance. The “hence” of the last proposition of CSA gives us the epistemic permission to ‘suspect’ that *A* is true. However, *to suspect is not to believe*. In other words, when we get the abductive conclusion, we are still ignorant. In that sense, Abduction is ignorance-preserving (Gabbay & Woods 2005, 2006), i.e. it maintains the epistemic status of the original epistemic ‘genuine’ doubt, although it could remove the emotional dimension of the surprise (“a matter of course”). This is why Peirce insisted that the abductive conclusion – in scientific inquiry – must be stated as a question (CP 2.634, 1878), as a suggestion (MS 440: ISP34, 1898), and must be “entertained interrogatively” (CP 6.524, 1901). This idea is coherent with the fact that CSA’s second premise has a purely subjunctive form, that is to say, in the moment we advance the hypothesis, its truth is presumptive, not factual. So, even if we have an irresistible inclination to believe our guesses, if we want to behave scientifically – and thus, to be epistemically responsible in our belief-formation – we must not surrender to that inclination (CP 6.469–470, 1908).

With Deduction we develop the meaning of hypotheses (this is the pragmatic connection), and with Induction we test them. When the testing is favorable to the hypotheses, we are justified to believe them (Hookway 2005: 103), or better, to hold them as ‘scientific opinions’ (CP 1.635; RLT: 112, 1898; cf. CP 7.185, 1901).

By its very nature, Abduction cannot prove anything: the word “proof” cannot apply to it, because the meaning of “proof” is concerned with removing a real doubt. Instead, “proof” is applicable to Induction (CP 2.782, 1901–1902), because the epistemic role of Induction is precisely to remove doubts by justifying the formation of beliefs (scientific opinions).

For Peirce, abductive conclusions (scientific suspicions) will always have an inferior epistemic status than inductive conclusions (scientific opinions) or, as contemporary logicians say, abductive conclusions are epistemically sub-par relative to background knowledge and inductive conclusions. Abductive conclusions are conjectures, no less, but no more: Abduction begins with a lack of

knowledge and ends in the same way; the conjecture is a promise of knowledge, but not knowledge at its full rank. If we were allowed to believe our guesses, we would stop the inquiry when we arrived at them, without any need for deductive or inductive work. But this is not the case, at least for Peirce.

Induction begins with lack of knowledge (because Deduction, which should precede it, develops hypotheses, but does not make them either true or false) and ends with knowledge, in the sense of justified belief. This being so, a justified Peircean belief – i.e. as a habit of action – is attained by Induction. But a well conducted Induction requires predesignation, sampling, and the precession of a well conducted Deduction and a proper Abduction. In this sense, only through Induction we attain (scientific) beliefs.

Accordingly, the abductive “hence” differs from that of the Induction. Let me refer to them, respectively, as the “hence” which “preserves the genuine epistemic doubt condition” and the “hence” which “discharges the doubt condition”. My point here is that there is a *qualitative epistemic gap* between everything which falls under the ‘range of the suspicious’ (abductive conclusions) and that which falls under the ‘range of scientific opinion’ (i.e. belief attained through scientific control, and not by another fixation-method). If the difference were quantitative, i.e. a matter of degree⁴, the epistemic difference between Abduction and Induction would be a mere matter of degree, as ‘Inference to the Best Explanation’ advocates propose (cf. Harman 1965; Thagard 1981; Lipton 2004).

Finally, in case these three criteria have any cogency and soundness regarding the comprehension of Peircean Abduction (and Induction), some consequences could be drawn for Peirce’s scholarship, the philosophy of science (e.g. their comparison with Inference to the Best Explanation), artificial intelligence, and contemporary logic. Due to space, I cannot make justice to those issues here, but I invite the reader to look at Niño (2008) in order to explore some of them.

⁴ In this analysis is not the case that Abduction provides beliefs and Deduction and Induction make those beliefs secure, as Misak (1991: 87) has proposed.

Frank Nuessel¹

57 Terminology and Scientific Advancement

As to the ideal of to be aimed at, it is, in the first place, desirable for any branch of science that it should have a vocabulary furnishing a family of cognate words for each *scientific* conception, and that each word should have a single exact meaning, unless its different meanings apply to objects of different categories that can never be mistaken for one another. To be sure, this requisite might be understood in a sense which would make it utterly impossible. For every symbol is a living thing, in a very strict sense that is no mere figure of speech. The body of the symbol changes slowly, but its meaning inevitably grows, incorporates new elements and throws off old ones. But the effort of all should be to keep the *essence* of every scientific term unchanged and exact; although absolute exactitude is not so much as conceivable. Every symbol is, in its own origin, either an image of the idea signified, or a reminiscence of some individual occurrence, person or thing, connected with its meaning, or is a metaphor. Terms of the first and third origins will inevitably be applied to different conceptions; but if the conceptions are strictly analogous in their principled suggestions, this is rather helpful than otherwise, provided always that the different meanings are remote from one another, both in themselves and in the occasions of their occurrence. Science is continually gaining new conceptions; and every new *scientific* conception should receive a new word, or better, a new family of cognate words. The duty of supplying this word naturally falls upon the person who introduces the new conception; but is a duty not to be undertaken without a thorough knowledge of the principles and a large acquaintance with the details and history of the special terminology in which it is to take place, nor without a sufficient comprehension of the principles of word-formation of the national language, nor without a proper scientific study of the laws of symbols in general. That there should be two different terms of identical value may or may not be an inconvenience, according to circumstances. Different systems of expression are often of the greatest advantage. (CP 2.222, 1903).

This quote, which appears in “Ethics of Terminology” (CP 2.222), addresses the need for terminological exactitude and precision in science. Peirce recognized that terminological specificity is a very important component of science. Likewise, Peirce (CP 2.222) recognized that “[s]cience is continually gaining new conceptions; and every new *scientific* conception should receive a new word, or better, a new family of cognate words”. In this sense, Peirce’s observation may be interpreted to mean that scientific innovation requires not just a new lexicon, but, rather a new system of cognitive conceptualization to introduce advancements, which explain the expansion of knowledge.

In his essay on the icon, the index, and the symbol (CP 2.274–308), Peirce states that “[a] *sign* or *Representamen*, is a First which stands in such a genuine

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triadic relation to a Second, called its *Object*, as to be capable of determining a Third, called its *Interpretant* to assume the same triadic relations to its Object in which it stands itself to the same Object” (CP 2.274).

Peirce then notes that “[t]he most fundamental [division of signs] is into *Icons*, *Indices*, and *Symbols*” (CP 2.275). Peirce further states that a sign may be *iconic*, by which he means that it “... may represent its object mainly by its similarity, no matter what its mode of being. If a substantive be wanted, an iconic representamen may be termed a *hypoicon*” (CP 2.276). Peirce subdivides hypoicons into three basic types, which he describes as follows (CP 2.277): (1) *images* are “[t]hose which partake of simple qualities”; (2) *diagrams* are “those which represent the relations mainly dyadic ... of the parts of one thing by analogous relations in their own parts”; and (3) *metaphors*, “... which represent the representative character of a representamen by representing a parallelism in something else ...”. The third type of hypoicon, the metaphor, crucially involves the notion of parallelism, which *The American Heritage Dictionary of the English Language* (Morris 1979: 951) defines as “[l]ikeness, correspondence, or similarity in aspect, course, or tendency”. In this sense, Peirce’s notion of this third category of hypoicon relates to the scientist’s explanation of the unknown in terms of the known.

In his characterization of the third subdivision of hypoicons, or metaphors, it may be said that Peirce anticipates the twentieth century transformation of theoretical progression in science through the vastly changed view of metaphor beyond its traditional notion as a literary adornment or figure of speech (Nuessel 2000: 489–495). In this regard, Peirce foreshadows the view of metaphor as a cognitive mechanism designed to enhance comprehension of novel ideas and theories as espoused by I. A. Richards (1936), Max Black (1962), Hesse (1966), and Lakoff and Johnson (1980). For scientific breakthroughs to take place, in the sense of scientific revolutions, to use Kuhn’s term (1970: 182–7); these paradigmatic shifts must employ new language and new conceptualizations, or redirect existing language and concepts, to break free of previous paradigmatic shackles that impede scientific progress. Scientific revolutions frequently involve simple, albeit elegant, symbolic generalizations that serve to resolve lingering questions that a previous paradigm is unable to explain or resolve. Often these dramatic innovations are the work of a single genius, whose perceived radical ideas, attracts a following among the next generation of scientists who adopt the ideas of the new leader. The revolutionary progression from a previous model to a new one involves metaphorical re-conceptualization of the novel idea as well a new term, or a deft re-use of re-purposed previous terms and concepts to refer to it.

Diachronic linguistics teaches us that language changes over time in terms of its phonetic, phonological, morphological, syntactic, lexical, and semantic manifestations. What is of concern here is semantic change as a reflection of conceptual revolution. Science, which is, by its very nature, organic in its search for universal principles, requires the ability to accommodate new information and change through language and appropriate corresponding symbolic representation. One way to reflect the ever-changing world of science is to re-target extant models to explicate concepts so that the new theoretical approach may be linked to a known and accepted conceptual precedent. What Kuhn (1970) labeled paradigmatic shifts in normal science is often metaphorical in nature. Paradigms, in Kuhn's (1970: 182–7) view, contain four features: symbolic generalizations, models, values, and exemplars (Percival 1976: 286). Science often depends upon the use of metaphor to introduce novel conceptual notions because this cognitive strategy allows the innovator to present the unknown in terms of the known. Whenever change occurs in science, previous metaphoric models must change as well. These changes also appear in the scientific lexicon based on paradigmatic shift. Such changes may involve revamped older terms applied to novel phenomena, or the introduction new lexical items from another domain.

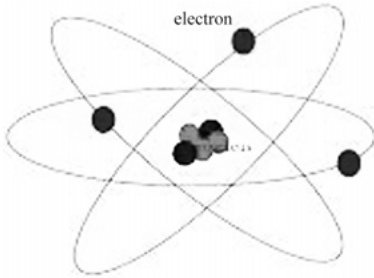
In his discussion of his third category of hypoicons, or metaphors, Peirce (CP 2.277) aptly pointed out that hypoicons, "... which represent the representative character of a representamen by representing parallelism in something else, are *metaphors*". In this sense, Peirce's view is that metaphor draws parallelisms to previously acknowledged objects or phenomena. Thus, it has correspondences in modern cognitive scientific views of metaphor i.e., the innovator demonstrates and equates new conceptualizations of a scientific notion with a previously existing and accepted phenomenon through congruency and resemblance, i.e., parallelisms.

Two examples suffice to illustrate this approach to the advancement of knowledge. It is clear that Peirce anticipates the cognitive model set forth in Lakoff & Johnson's *Metaphors We Live by* (1980: 5) in which they state that "*the essence of metaphor is understanding and experiencing one thing in terms of another*" (emphasis in original, FN). Metaphor thus allows scientists to expand their conceptual universe through the comprehension of novel constructs that parallel existing and familiar models. It is precisely in this view of metaphorical constructs that parallel a known feature of the world with an unknown – one that Peirce foreshadows with his notion of the third manifestation of hypoicon, or metaphor, which draws parallels between novel notions and pre-existing ones.

In the following discussion, two exemplars of metaphorical modeling will be demonstrated. Both examples come from physics. The first involves the diagrammatic model devised to explain and conceptualize the structure of the

atom. The second concerns the physics of superfluidity, explicated by reference to a lexical item in a verbal description of an improbable creature from a work of children's literary fantasy.

The concept of the atom, which is a basic building block of matter, consists of a nucleus, an electron, and a proton. The configuration of these elements involves the use of the revolutionary Copernican model of the solar system with its central sun and its orbiting planets, itself a scientific revolution against the Ptolemaic model of the universe, wherein the earth was the center of the galaxy, as a point of departure for explaining atomic structure. Experimental physicist Ernest Rutherford, and Nobel Prize winner (1908) for physics, developed the "Rutherford model of the atom", which was subsequently modified by Niels Bohr, another winner of the Nobel Prize for physics (1922). A popular version of the model appears in Figure 1. This model utilizes the planetary representation to illustrate the relationship of the nucleus of the atom to a series of orbiting interdependent elements much like our solar system with the sun as the center and planets revolving around it. In this sense, iconicity serves as representation through a previously accepted and recognizable objective astronomical instantiation, which is then applied to new domains. The planetary model of the atom is thus a diagram, which renders a novel conception through metaphor (CP 2.277). It must be noted at this juncture that Figure 1 fails to meet Peirce's (CP 2.276) criterion for hypoicon because Peirce described a hypoicon in the following terms by noting that it is "[a]ny material image, as a painting, is largely conventional in its mode of representation; but in itself, without legend or label it may be called a hypoicon". Thus, Figure 1 with its legend is not a Peircean hypoicon. This diagram, without verbal content, would, however, constitute a Peircean diagram. Because the Copernican heliocentric model of the universe is so well known, it was easy to draw obvious parallels to the newly conceived notion of the atom as a miniature solar system. In this re-modeling approach to the advancement of science, known scientific principles, and their respective terms are applied to a previously unknown phenomenon to explicate the new principle by applying previously familiar concepts and terms to it.



Atomic Planetary Model

Figure 1: Planetary Model of the Atom

In the second example, physicist N. David Mermin recalls the precise moment when he created the term “boojum” to describe the physical properties of “superfluid helium-³” – an anisotropic liquid (1981: 46). In writing his paper on the specific patterning of the physical characteristics of the liquid, Mermin recalled the Lewis Carroll (pseudonym of Charles Lutwidge Dodgson) poem *The Hunting of the Snark*. His entire paper discusses the fierce professional challenges he faced when he tried to introduce this term from Lewis Carroll’s (1981: 63) final lines of the poem *The Hunting of the Snark* from which this lexical item and the theoretical physical conceptual notion derives: “He had softly and suddenly vanished away – For the Snark was a Boojum, you see”. Many academic journal editors accepted his papers on this liquid, albeit with one required revision, namely, the elimination of the term “boojum”. Ultimately, the problematic expression was accepted, and ‘boojum’ became an international term to describe the phenomenon of the anisotropic fluid in various languages. As Peirce noted (CP 2.222) “[s]cience is continually gaining new conceptions; and every new *scientific* conception should receive a new word . . .”. This tale of the introduction of a scientific neologism for a newly observed physical property illustrates that resistance to terminological innovation to describe novel natural properties may occur if they derive from children’s nonsense literature. Peirce (CP 2.222) argues that the originator of new terms must be familiar with “the principles of word formation of the national language”. Nevertheless, this word presented grammatical problems for the English language since some scholars were unsure of its proper plural form because some physicists perceived the word to be a Latin neuter noun, which demanded a plural form in that language, i.e., ‘*booja*’. After a good deal of parrying with editors of scientific journals, ‘boojum received an English plural form ‘boojums’. Mermin appears to have heeded Peirce’s advice about scientific terminology, but his editors apparently were unaware of Peirce’s

good counsel of more than a century ago. In this second case, Mermin employs a neologism from conventional language about a fantastic creature to explain the evanescent physical properties of a certain type of fluid. In this regard, Mermin introduction of the physical traits of the fictional creature labeled a 'boojum', he was able to describe a previously unrecognized physical phenomenon.

Peirce's views on scientific innovation through lexical enhancement and expansion foreshadow twentieth century research in metaphorical models as cognitive devices to advance knowledge. The use of lexical enrichment, based on parallelism with pre-existing models, thus allows the scientist to expand knowledge. Such models have always been used in the advancement of science, although prior models were often covert rather than overt. In this discussion, a graphic mechanistic representation (planetary model) served to explicate the structure of an atom by using previous metaphorical concepts based on mechanical astronomical models with accepted notions such as center, orbit, revolution, and so forth. On the other hand, the behavior of a fantastic and imaginary creature ('boojum') in a children's poem was called upon to describe the physical properties of a particular fluid in verbal terms, and it is, thus, a re-purposing an already existing invented expression.

Sami Paavola¹

58 Fibers of Abduction

It must be remembered that abduction, although it is very little hampered by logical rules, nevertheless is logical inference, asserting its conclusion only problematically or conjecturally it is true, but nevertheless having a perfectly definite logical form.
(CP 5.188, 1903).

One reason that makes Peirce's abduction so interesting is the claim that it is *both* a mode of inference *and* close to, or even the same as, essential cognitive processes like perception, insight, or instinct. For me the quote above shows Peirce's struggle with the claim that abduction comes close to various cognitive processes but still is also a specific, "weak" mode of reasoning.

Peirce was all the time developing abduction. It was not a linear process but Peirce cultivated his earlier conceptions in relation to his overall philosophical, logical and semiotic systems. He was changing some of his views and broadening and specifying his perspectives. This has resulted at various interpretations of abduction with somewhat different emphases. Peirce's texts are a rich source of inspiration for further development.

In this paper, I first go through two main phases of Peirce's abduction from a syllogistic treatment to a part of methodological processes where a guessing instinct is central. Then I delineate different kinds of reasoned and cognitive elements in Peirce's abduction. At the end I search alternative explanations to Peirce's claim that a guessing instinct is needed to explain the success of abductive search. I maintain that these alternatives; the use of clue-like signs, strategic considerations, and distributed processes; are in line with Peirce's overall philosophy but they need to be further developed.

Development of Peirce's abduction

It is customary to discern two main periods in Peirce's conception of abduction: 1) as an evidencing process, and 2) as that part of methodological processes where hypotheses are discovered (Burks 1946: 301; Fann 1970: 9–10).

At the early period Peirce treated abduction (or 'hypothesis' as he usually called it at that time) as an *evidencing process*. This early conception can be

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seen especially in his early lectures (Harvard lectures, 1865 and Lowell lectures, 1866), and in various published articles at 1867–1892. By inverting deductive syllogism, Peirce got basic formulas of both induction and abduction (see e.g. CP 2.619–644, 1878 where is also the famous beanbag formulation). Early on, Peirce interpreted abduction as a weak form of inference (W1: 283, 1865; CP 2.625, 1878) although there were different interpretations of what this “weakness” means. Usually, in these early papers, Peirce treated abduction as a form of probable reasoning (e.g. CP 5.349, 1869; CP 2.709, 1883) but sometimes additionally also “as a fair guess” (CP 2.623, 1878). Later he himself commented his early works (especially the paper of 1883) by writing that “I was too much taken up in considering syllogistic forms” and that contra those papers “probability proper had nothing to do with the validity of Abduction, unless in a doubly indirect manner” (CP 2.102, c. 1902; also HPPLS 2: 1031–1032, 1902).

Even when Peirce was developing abduction clearly as a form of syllogistic reasoning he analyzed close connections of it to other cognitive processes. Induction expresses “the physiological process of formation of a habit” while abduction [hypothesis] “substitutes, for a complicated tangle of predicates attached to one subject, a single conception” and produces “the sensuous element of thought” (CP 2.643, 1878; W1: 471–2, 1866). “[A] sensation is a simple predicate taken in place of a complex predicate; in other words, it fulfills the function of a hypothesis” (CP 5.291–292, 1868). Abduction is then here closely connected to sensations, emotions, and conceptions; they all are based on bringing a manifold to unity (see also W1: 516).

In his later period Peirce treated abduction (which he now called ‘retroduction’ or ‘abduction’) as a *first phase of a methodological process*. He did not abandon the syllogistic treatment but he needed to broaden the conception of abduction. As Burks (1946: 301–302) maintains this change was closely connected to Peirce’s development of his other philosophical and metaphysical systems, like re-interpreting his categories, and developing his pragmatistic and synechistic outlooks, among others. These developments of abduction can be found mostly in various unpublished manuscripts, lecture notes, and letters by Peirce (see terms ‘retroduction’, and ‘abduction’ in Bergman & Paavola 2003), and also in some published texts (e.g. CP 2.773, 778, 791; EPII: 434–450).

The later focus on methodological processes means that abduction, induction and deduction are closely interlinked. Peirce noticed that a comprehensive system of inquiry should cover better also how hypotheses are generated. This is the first phase of inquiry where abduction is needed, while deduction and induction are needed mainly for explicating and testing of these hypotheses. In this methodological interpretation, abduction is usually presented as starting with a surprising phenomenon (CP 5.189, 1903; EPII: 287, 1903). Peirce came to

the conclusion that he had “more or less mixed up” abduction and induction (Peirce CP 8.227–228, c. 1910). He maintained that in his early papers he had presented important forms of reasoning *but* they were more about abductive *induction* than abduction (HPPLS 2:1031–1032, 1902). Abduction is a weaker mode of inference than he often had presented. Or, he had been somewhat undecided on the strength of abductive reasoning. In his later works, abduction is not about probabilities but about suggestions, plausibilities, and what “may be”.

This weakness of abduction caused, however, a problem. It might sound a bit paradoxical, but by pointing out the basic weakness of abduction, Peirce at the same time realized that it must be strengthened with some other means. If abduction is about possibilities is it any more useful for explaining how hypotheses are generated? Peirce wanted to understand how scientists have come up with fertile hypotheses during the history of science, and he maintained that it cannot have happened by pure chance (CP 7.220, 1901). There would not have been enough time for that in the history of science (CP 5.591, 1903). And “may bes” and Firstnesses come very close to chance events.

With these kinds of considerations, Peirce ended up combining abduction more closely to a guessing instinct which seemed fit nicely to the development of his metaphysical system. In his early period Peirce had already maintained that men seem to have a special aptitude for guessing (CP 2.753, 1883) but he had explicitly emphasized that this is *not* a basis for abduction (CP 2.749, 1883). A mode of reasoning cannot lean on its validity on instinct. But while developing his metaphysical systems further, Peirce changed his mind. In his later works abduction appeals to instinct, or even *is* a guessing instinct (CP 6.476, 1908). Peirce developed various kinds of overlapping naturalistic and idealistic explanations for this instinct (see Paavola 2012: 123–149).

But even when Peirce strongly connected abduction to an instinct or an insight for guessing, he never abandoned “reasoned” considerations as a basis for abduction. In Harvard lectures at 1903 (where the quote of this paper is) Peirce analyzed the close connection of abduction to perception. Abductive suggestion “comes to us like a flash” and is “an act of insight, although of extremely fallible insight” (CP 5.181, 1903). But at the same time it “nevertheless is logical inference” (CP 5.188, 1903). In his later works, Peirce developed in various ways also these reasoned considerations (see below).

Elements of abduction

It can then be maintained that there are various potential building blocks for abduction in Peirce’s writings. The two main interpretations of Peirce, that is,

the syllogistic formulations (with different strengths) and also the methodological process highlighted reasoned considerations (especially the syllogistic treatment) but there were also many other elements involved.

“Reasoned considerations” highlighted, for example, elements of

- an inference of a cause from its effect (W1: 180, 1865),
- the economy of research (NEM 4:37–38, 1902),
- methodetic (NEM 4:62, 1902)
- interrogation (HPPLS 2:878–879, 1900),
- an inference through an icon (EPII: 287, 1903).

Cognitive (with modern terminology) considerations highlighted the elements of

- sensations, and emotions (CP 5.291–292, 1868),
- conceptions (W1: 516, 1866),
- guessing (CP 7.219, 1901),
- instinct (CP 7.220, 1901),
- insight (CP 5.173, 1903),
- perception and perceptual judgments (CP 5.180–194, 1903),
- pure play, and musement (CP 6.455–469, 1908)

Somewhere in between reasoned and cognitive considerations were elements highlighting

- the category of Firstness (CP 2.89–102, c. 1902),
- pattern recognition and making a confused tangle of things comprehensible (PPM 282–283, 1903),
- the maxim of pragmatism (CP 5.195–197, 1903),

This is not meant to be an exhaustive list of various elements or formulations in Peirce’s writings on abduction. Peirce himself made different kinds of mixtures of these elements. This is natural if one takes into account that Peirce was all the time aiming at developing abduction further. But it has also meant that later interpretations have varied quite a lot highlighting different formulations (see references: Paavola 2012: 46–47).

Peirce’s aim of describing processes of inquiry broadly especially in his later period has brought both fertility and tensions to his treatment of abduction. If abduction is closely connected to a guessing instinct (or to other cognitive elements), is it reasoning any more? Can it be a logic of discovery or is it a way of evaluating already existing hypotheses? Is abduction a special mode of inference, or just a part of either inductive or deductive reasoning?

The fertility of Peirce’s abduction can be seen in many interpretations concerning abduction. For long after Peirce’s death abduction was analyzed quite

marginally. This was because Peirce's philosophy in general was not much discussed but also while many of his insights (especially during his later period) concerning abduction were not published until collections of his works started to appear. N. R. Hanson defended abduction forcefully as a logic of discovery at 1950s and 1960s, and there were some other interested but somewhat detached remarks on abduction (e.g. by sociologist R. K. Merton), besides focused Peirce scholarship (e.g. Burks 1946; Fann 1970). A wider attention to abduction was brought by "friends of discovery" who around 1980s started to defend discovery as a legitimate topic contra prevalent trends in the philosophy of science (see Nickles 1980). At the same time, many semiotically oriented researchers started to get interested in abduction as a logic used by detectives (see Eco & Sebeok 1983). Nowadays different aspects of abduction (also in relation to the inference-to-the-best explanation model) are defended in many areas of research (see Paavola 2012: 31–55)

Peirce's way of combining reasoned and instinctual aspects has resulted in one main criticism against abduction as a logic of discovery. Reichenbach represents an early formulation of this criticism: "his [Peirce's] remarks concerning what he calls "abduction" suffer from an unfortunate obscurity which I must ascribe to his confounding the psychology of scientific discovery with the logical situation of theories in relation to observed facts" (Reichenbach 1938: 36; see also Frankfurt 1958). Similarly N. R. Hanson's defence of Peirce's abduction as a logic of discovery were criticized from confounding psychological act or instantaneous Gestalt switches with reasoning. This was done also by the "friends of discovery" who otherwise defended the role of Hanson for groundbreaking work on discovery (see Nickles 1980: 23–24).

Hanson saw the situation the other way around which I think is in line with Peirce's account: by tightly separating logic and discovery, the prevalent theories made discovery mysterious. Hanson commented the proponents of the hypothetico-deductive models that they "dismiss the dawning of an hypothesis as being of psychological interest only, or else claim it to be the province solely of genius and not of logic. They are wrong" (Hanson 1958: 71).

Further developments – my own reading

My own interpretation of abduction is that Peirce masterfully developed abduction as a weak form of inference. Abduction concerns suggestions and "may be's". Peirce also consistently maintained that abduction is a form of *reasoning* even when it is close to instinct, perception, and insight. My criticism to Peirce,

however, is that in his *later* works he combined abduction too closely and tightly to instinctual elements. I would defend here, instead, Peirce's early work where he separated abductive reasoning from instinct and other aspects of cognition, but still saw close analogy between them. Early-Peirce had maintained that reasoning cannot be validated by assuming that human beings have a special adaptation of the mind to the universe (CP 2.749, 1883). It seems that he changed his mind when he came to a decided conclusion that abduction is a very weak mode of inference. I think that there was no urgent need for marrying abduction and instinct. Peirce could have used other elements of his overall philosophy to develop abduction further.

But the weakness of abduction is a double-edged sword. It seems apt for processes which concern new possibilities – and discovery. Discoveries concern search for, or recognition of novel possibilities. But if abduction is basically very weak is it of any use in illuminating how human beings in general come up with good and fertile ideas? I think that there are means of strengthening abductive processes like analyzing both 1) the use of *clue*-like signs, 2) more generally the processual and *strategic* point of view, and 3) *distributed* processes of discovery (see Paavola 2012). And I think that Peirce came close to developing these means although not explicitly in relation to abduction.

As far as I know, Peirce did not explicitly develop ideas on *clue*-like signs in his semiotic theory. But clues (and related signs) can be found in Peirce's descriptions of abduction (see also Eco & Sebeok 1983). Clues are involved both when Peirce highlights that abduction starts with *surprising* phenomenon and with a "mass of facts" suggesting a theory (CP 8.209, c. 1905; also EPII: 287, 1903). These mass of facts are clues for suggestions. There is also a famous detective story by Peirce on what he claimed happened to him (Peirce 1929²; see Eco & Sebeok 1983). In that paper he himself, however, did not analyze abductive reasoning but a guessing instinct where the use of clues was not clearly explicated.

Peirce came close to developing strategic outlook on abduction and reasoning. For me strategies mean that various ways of searching, anticipating, and combining "moves" of inference are highlighted. This means that clues, constraints and search for connections are used while searching fertile hypotheses abductively (see Paavola 2012: 206–211). I think that strategies are involved, for example, when newer methodological literature highlights that abduction does not start solely from data but aims at developing a novel connection between previous theoretical ideas and data (e.g. Dubois & Gadde 2002). Peirce came close to this kind of an approach to abduction in many places especially when

2 Peirce, Charles S. (1929). "Guessing", Hound & Horn, vol. 2(3), 267–282.

highlighting methodetic or the economy of research as a basis for abduction, or when maintaining that abduction aims at making comprehensible a state of things which seems at first perplexing (CP 8.229–230, c. 1910). I think that early-Peirce was so much focusing on syllogistic forms and later-Peirce on a guessing instinct that he did not see clearly the need for this kind of a strategic outlook on abduction.

If the aim is to develop understanding of dynamics of theory generation, modern ideas of distributed cognition are important (see Magnani 2009). People are not developing ideas just by reasoning but by using and being in interaction with different kinds of social, material and cultural resources (Paavola 2012: 189–200). How scientists come up with fertile ideas? Peirce's main answer was that human beings must have a natural tendency of finding true hypotheses. “*Il lume naturale*” guides us (CP 1.630, 1898). An alternative explanation would be that cultural and social (“*il lume culturale*”) as well as material (“*il lume materiale*”) interaction give guidance to scientists even when they are searching novelties. Peirce emphasized anti-cartesianism and social aspects of science and research. He had ideas which are close to “augmentationist” approach to mind and knowledge where the role of external artefacts and tools are emphasized instead of processes inside the human head (Skagestad 1993).

I think that it is important to see the role of distributed abduction besides other, more traditional formulations of abduction. All fibers of abduction are needed if the aim is to understand better processes of inquiry.

Torill Strand¹

59 Experience and Education

In all the works on pedagogy that ever I read, – and that have been many, big, and heavy, – I don't remember that any one has advocated a system of teaching by practical jokes, mostly cruel. That, however, describes the method of our great teacher, Experience. She says, Open your mouth and shut your eyes; and I'll give you something to make wise; and thereupon she keeps her promise, and seems to take her pay in the fun of tormenting us. (EPII: 154, 1903).

What is Peirce's notion of experience? And how is experience related to educational processes? The quote above may illustrate Peirce's distinct notion of experience, which he introduced in his 1903 series of seven Harvard lectures (EPII: 133–241)². A tentative reading³ of these lectures demonstrates how Peirce's conception of experience is a vital key to his later philosophy⁴, and the way in which this appeals to philosophers of education, as it invites a semiotic reading of mind and cognition (Strand 2012). So, let us take a closer look at how Peirce portrays the rudeness of lived experience in relation to educational processes.

Peirce does not undermine learning from reasoning, but argues that “what we are taught by experience is not justified at all: on the contrary, the less it is like previous knowledge, the more valuable an information it is, other things being equal” (EPII: 454). In stressing the value of experiences violating previous thought, playing by chance, and learning from unexpected events, Peirce even compares experience to a practical joke. A practical joke, despite its cruelty, may be a good thing as it makes us learn.

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² Peirce named these lectures simply “Lectures on Pragmatism” and stated that they should treat one single topic: “Pragmatism” understood as “one of the propositions of logic”. However, as William James sponsored the lectures, Peirce left it to him to announce the subject. The title James gave them – “Pragmatism as a Principle and Method of Right Thinking” – is thus just one of many signs of James' tendency to turn Peirce's broad logic into a principle and method of right thinking (Turrisi 1997).

³ To my reading, the writings of Bergman (2005, 2007, 2009), Colapietro (2001, 2005), Freadman (2004), Short (2007) and Turrisi (1997) have been especially helpful.

⁴ Peirce's mature philosophical texts mirror a “re-conceptualisation of his entire philosophical enterprise” (Short 2007: 60). In his early writings, Peirce explored fruitful processes of inquiry. In his later writings, however, Peirce offers a richer conception of productive learning processes as he now takes a clearer meta-philosophical stance by establishing an explicit connection between his phenomenology, pragmatism and semiotic, and thus renewing all three.

Consequently, there seems to be a parallel between Peirce's claim that jokes "make wise", and Aristotle's claim that riddles convey learning. Peirce speaks about "teaching by practical jokes". Aristotle says that "Good riddles are pleasing ... for there is learning" (Rhetoric 1412a: 26). A riddle provides an unexpected and contradictory image, concurrently saying that "this is that" and "this is not that". This paradox surprises, bewilders and helps to uncover a hidden relation beyond the paradox. The paradoxical attribution of riddle first, surprises – as it describes a fact in an unexpected manner; next, it bewilders – as it contests our previous categories of thought; and third, it conveys learning – as it uncovers a relationship hidden beneath the paradox (Strand 2012; 2014). But a difference between Aristotle and Peirce is that Aristotle attributes learning to the "impossible combination of words", while Peirce attributes learning – as he says – to "the *action of experience*" (EPII: 154, my emphasis). This action comes forward as "a series of surprises":

The phenomenon of surprise in itself is highly instructive ... because of the emphasis it puts upon a mode of consciousness which can be detected in all perception, namely, a double consciousness⁵ at once of an ego and a non-ego, directly acting upon each other. (EPII: 154).

So, the most significant characteristic of experience is its "pedagogy of surprise", which definitely cannot be narrowed down to an educational mean or method. On the contrary, Peirce attributes the surprise to the contradictions *inherent in experience itself*. Imagine that

Your mind was filled with an imaginary object that was expected. At the moment when it was expected the vividness of the representation is exalted, and suddenly when it should come – something quite different comes instead. I ask you whether at that instant of surprise there is not a double consciousness, on the one hand of an Ego, which is simply the expected idea suddenly broken off, on the other hand of the Non-Ego, which is the Strange Intruder, in his abrupt entrance. (EPII: 154).

The series of surprise, which indeed jumbles our categories of thought, happen because of a double consciousness⁶ that is aware – on the one hand – of the familiar and vivid representations of the expected and – on the other hand – of the new and unexpected ways of seeing. So, the surprise is not in the abrupt and

⁵ We should avoid a narrow, psychological interpretation of the term "consciousness", as Peirce's model of Mind (with a capitalized M) clearly moves beyond a psychologist model. Following Hausman (1993), "consciousness" should here be read in the light of Peirce's account of the role of perception in "The Law of Mind".

⁶ See note 2.

unexpected. The surprise is rather in the relationship between the known and the unknown; between the familiar and the new; or between the “expected idea” (effort) and the “strange intruder” (resistance). So, experience is irreducibly double-sided, concurrently containing effort and resistance. The reason for the surprise is that experience comprises the relation between the two. This relation is in the sign. In stressing this relation, or rather the experience of the sign’s action through a double consciousness, Peirce questions a Cartesian dualism. He says: “every philosopher who denies the doctrine of Immediate Perception, – including idealists of every stripe, – by that denial cuts off all possibility of ever cognizing a *relation*” (EPII: 154, my emphasis).

So, there is a parallel between Peirce’s practical joke and Aristotle’s riddle, which articulates truly new things in an unexpected manner. There is also a parallel between Peirce and Aristotle in the ways in which the paradoxical attribution of the riddle – or the joke – surprises, bewilders and teaches. But to Peirce, the reason for learning from this bewilderment – or “the series of surprises” as he says – is not in the riddle’s impossible question or the mysterious way of speech, but rather in the *action* of experience: Experience is a great teacher because she is acting upon our minds, bewildering our categories of thought, and making us learn. But how should we read Peirce’s distinctive notion of experience?

Peirce clearly advocates a broad notion of experience. “Experience can only mean the total cognitive result of living, and includes interpretations quite as truly as it does the matter of sense” (EPII: 197). Accordingly, Peirce discards a sensational conception of experience. In a letter to William James, he asserts that: “... experience and an experiential event are ... utterly different, experience being the effect that life has produced upon habits” (EPII: 203). Peirce criticizes James’ way of limiting experience to sensations and their patterns, since such a narrow conception overlooks the interpretational aspects: A sensation is not the same thing as an experience, since experience is “the effect that life has produced upon habits” (EPII: 203). Peirce’s phenomenological categories⁷ can be read as a conceptual hypothesis for the nature of experience.

... the kind of elements, that are invariably present in whatever is, in any sense, in mind. According to the present writer, these *universal categories* are three. Since all three are invariably present, a pure idea of any one, absolutely distinct from others, is impossible; indeed, anything like a satisfactorily clear discrimination of them is a work of long and active mediation. They may be *Firstness*, *Secondness* and *Thirdness*. (EPII: 267).

⁷ There is no evidence that Peirce knew of Husserl’s *Logische Untersuchungen*, which had been published just two years earlier (Brent 1998; Short 1907). When Peirce first used the word “phenomenology”, he referred to Hegel. However, already in 1904 he replaced the word “phenomenology” with “phaneroscopy”.

Here, Peirce's reason for using the systematic and somewhat formalistic terms of firstness, secondness and thirdness, seems to be the fact that these categories derive from his early work concerning the logic of relations⁸ (Short 2007): When naming the categories "Firstness", "Secondness", and "Thirdness", Peirce made it obvious that he conceived these general features of experience irreducibly monadic, dyadic, or triadic.

Firstness is pure presence; it is what there is, regardless of anything else. It is "what stares one in the face, just as it presents itself, unreplaced by any interpretation, unsophisticated by any allowance for this or for that" (EPII: 147). Firstness is nomadic in the sense that it has only one relatum: The color red is red. The color comes forward as a quality, a pure presence, or an attribute without reference to anything else. It is what it is. Redness is thus an illustrating example on how firstness is a nomadic "mode of being of that which is such as it is, without reference to anything else". It is the immediate presence of qualities. "When anything is present in the mind, what is the very first and simplest character to be noted in it, in every case, no matter how little elevated the object may be? Certainly, it is its *presentness*" (EPII: 149).

Secondness is reaction; it contains simultaneously pure presence and our perception of this presence. This reaction "fastens itself like a bulldog upon the particular feature that we are studying" (EPII: 147), since it is "the Idea of that which is such as it is . . . regardless of anything else" (EPII: 160). Secondness is dyadic, in the sense that it is a relation with two relata at a time: For example the color red and our perception of redness. Secondness simultaneously involves the pure presence of the color red and the perception of it; the effort and the resistance; "the expected idea and the strange intruder". In this way, Peirce's category of secondness thus points to the ways in which immediate perception is always an *awareness of a relation*. Moreover, since secondness entails firstness, secondness is an *element of the phenomenon itself*. Secondness "represents two objects to us; an *ego* and a *non-ego*" (EPII: 195). In this respect secondness is a dyadic, or double, consciousness that is aware on the one hand of the pure and vivid presence and on the other hand of the perception. "Category the Second is the Idea of that which is such as it is as being Second to some First, regardless of anything else . . . That is to say, it is *Reaction* as an element of Phenomenon". This "category of reaction" is "beyond all doubt an irreducible element of thought" (EPII: 160). However, secondness does not involve the phenomenon of mediation, transaction, or learning from experience.

⁸ Peirce offers a brief introduction to this logic in his 1886 paper "First. Second. Third" (EPI: 242–244).

Thirdness is transaction⁹; it “essentially involves the production of effects in the world of existence, – not by furnishing energy, but by the gradual development of Law” (EPII: 271). Thirdness is triadic, in the sense that it is a relation with three relata at a time: Taking the example used above, these three relata could for example be the pure presence of the color red; the relation between redness and our perception of it; and the combination of the two (which is the third relatum). So, despite the fact that thirdness contains firstness and secondness, it is by no way reducible to the two: “The irreducibility of the idea of Thirdness appears to me to be evidently proved in the Logic of Relations” (EPII: 169). According to this logic, “all measure, all quantity is thirdness”. This logic of relations also proves that “continuity involves thirdness in an eminent degree” (EPI: 306). It is this sophisticated notion of thirdness as a generic multiple¹⁰ that supports Peirce’s claim that experience is “the effect that life has produced upon habits” (EPII: 203).

So, in addition to the immediate qualities of “pure presence” (firstness) and the forceful dyadic consciousness of “reaction” (secondness) thirdness entails “transaction”. This third category substantiates Peirce’s claim that experience has an import on our habits. Moreover, since Peirce holds that experience is to be recognized by the way our habits are being transformed, *thirdness is an element of the phenomenon itself*: “Category the Third is the Idea of that which is such as it is as being a Third, or Medium, between a Second and its First. That is to say, it is *Representation* as an element of Phenomenon” (EPII: 160). Consequently, thirdness – the category of representation, transaction, and habit-change – is in experience:

But the saving truth is that there is a Thirdness in experience, an element of Reasonableness to which we can train our own reason to conform more and more. If this were not the case there could be no such thing as logical goodness or badness; and therefore we need not wait until it is proved that there is a reason operative in experience to which our own can approximate. We should at once hope that it is so, since in that hope lies the only possibility of any knowledge. (EPII: 212).

⁹ Before introducing Thirdness in his second Harvard lecture, Peirce prepared the audience on the very sophisticated logic that underlies this third category of experience: “Thus far, gentlemen, I have been insisting very strenuously upon what the most vulgar common sense has every disposition to assent to and only ingenious philosophers have been able to deceive themselves about. But now I come to a category which only a more refined form of common sense is prepared willingly to allow, the category which of the three is the chief burden of Hegel’s song, a category toward which the studies of the new logico-matematicians, Georg Cantor, and the like are steadily pointing, but to which no modern writer of any stripe, unless it be some obscure student like myself, has ever done any approaching to justice” (EPII: 155–156).

¹⁰ Here, the German mathematician Georg Cantor’s theorem of the “infinity of infinities” is quite apparent in Peirce’s formulation of the third category of experience.

In short, the third category is a key to Peirce's phenomenology, as it helps to understand Peirce's claims that experience is "a forcible modification of our ways of thinking" (EPII: 370) and "a brutally produced conscious effect that contributes to a habit" (EPII: 399). However, it should again be emphasized that this "forcible modification of our ways of thinking" and "brutally produced conscious effect" is not something external to experience. The reasonable transactions are part of experience itself, as *thirdness is in experience*. Or – to use Peirce's own words – we should at least hope that it is so, "since in that hope lies the only possibility of any knowledge" (EPII: 212).

In sum, the three ever-present phenomenological categories help us to understand the ways in which experiences direct our habits of thought and action. It should be underlined, however, that Peirce's formulation of these three categories should not be interpreted in a formal way. On the contrary, Peirce's broad categorical conception of the ever-present and general features of experience is "first obtained abductively and inductively from the rough and tumble of ordinary experience" (Bergman 2007: 79). Colapietro holds that these categories should not be regarded as "static taxonomic but rather as a dynamic interrogative framework" (Colapietro 2001: 202). Moreover, Short argues that the lack of firm foundation of the categories is not a defect, but rather Peirce's way of moving beyond a Kantian or transcendental justification: "Peirce rejected a priori philosophizing; his later thought registered an openness to unanticipated experience; in it, there is a sense of adventure" (Short 2007: 66). So evidently, the categories are not only a key to Peirce's mature philosophy of mind, but also a substantiation of the claim that "*Experience is our great Teacher*" (EPII: 194).

John J. Stuhr¹

60 Peirce, Pragmatism, and Purposive Action

The elements of every concept enter into logical thought at the gate of perception and make their exit at the gate of purposive action; and whatever cannot show its passports at both those two gates is to be arrested as unauthorized by reason. (EPII, 241, 1903).

In 1897, seven years after the appearance of *The Principles of Psychology*, William James published *The Will to Believe and Other Essays in Popular Philosophy*, a book dedicated to Peirce. James emphasized the role of the will and action and the role of interest and feeling in the acquisition and justification of belief. While Peirce disagreed with James in many ways, he began to reconceive his own philosophy along these lines—understanding logic as a “normative science” that depends on ethics, another normative science that, in turn, depends on aesthetics, the third normative science. If action and emotion as well as reason produce knowledge, what is the nature of logic? What is the nature of logic understood as a normative science?

In 1898, shortly after listening to Peirce’s eight Cambridge lectures (that included “Philosophy and the Conduct of Life” and “The First Rule of Logic”), James delivered an address to the Philosophical Union at Berkeley that linked intimately and irreducibly the meaning of concepts and the justification of belief to consequences of, and in, practices. It was in this influential address, “Philosophical Conceptions and Practical Results”, that James first publicly called his philosophy “pragmatism” and explained that he took this name from Peirce whom he identified as the founder or father of pragmatism. However, in “Philosophy and the Conduct of Life”, Peirce earlier that same year “condemned” the “tendency to mingle Philosophy and Practice”, claiming that “pure theoretical knowledge, or science, has nothing directly to say concerning practical matters, and nothing even applicable at all to vital crises” and that “the two masters, *theory* and *practice*, you cannot serve” (EPII: 29, 33, 34). If theory and practice are separate, what is the nature of pragmatism? What is the nature of pragmatism justified not by popular interests and psychological satisfaction but, instead, by scientific evidence?

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James arranged for Peirce to deliver in 1903 a series of lectures at Harvard University (though Peirce's reputation necessitated an off-campus location). Sinking ever deeper into personal misery, bodily sickness, financial ruin, and professional isolation, this invitation was in many respects a lifeline. Peirce had written his "On a New List of Categories" 36 years earlier. His thinking had changed dramatically. The earlier categories (Quality, Relation, and Interpretant) were set forth to reduce the manifold of sensuous impressions to unity. However, by 1893, if not earlier, Peirce's concern with unity had been replaced by his commitment to continuity, which he viewed as governing every aspect of experience. His concern was no longer about what conceptions are capable of being "prescinded" (EPI: 1ff), but rather what conceptions advance the goals of inquiry, the goals of science. If inquiry can be more or less successful, with what categories does successful inquiry operate? What, in Peirce's new language, is the phenomenology of pragmatism?

25 years before his Harvard lectures on pragmatism, Peirce wrote that the meaning of a concept is the conceivable sensible effects of its object (e.g. EPI: 132). In this light, what is the meaning of a concept if one understands the determination of its object as a matter of will and emotion as well as reason? What justification is there for determining the meaning of a concept pragmatically? And, what categories of experience are presupposed and/or produced when the meaning of concepts is understood in this way? In the Harvard lectures of 1903, Peirce attempted to answer these questions. And, along the way, he tried to answer one more: Why is his formulation of pragmatism superior to those of more popular pragmatist philosophers who direct pragmatism toward "vital topics" – thinkers like James in the USA, Schiller in England, and Papini in Italy?

What is pragmatism? In "The Maxim of Pragmatism", Peirce wrote (in a characteristically non-catchy manner) that it "is the principle that every theoretically judgment expressible in a sentence in the indicative mood is a confused form of thought whose only meaning, if it has any, lies in its tendency to enforce a corresponding practical maxim expressible as a conditional sentence having its apodosis in the imperative mode" (EPII: 134–5). And he refers to his original formulation of the "Maxim of Pragmatism:" "Consider what effects might conceivably have practical bearings we conceive the object of our conception to have: then, our conception of those effects is the whole of our conception of our object" (EPII: 135 [EPI: 132]). Peirce explained that this maxim, if it is true, is useful (for probability theory, insurance companies, etc.). Is it true? (A pragmatist here should be tempted to ask: 'what do you mean by true?') "What is the proof that the possible practical consequences of a concept constitute the sum total of the concept" (EPII: 139)? Peirce wrote that in 1878 his proof of the

pragmatic maxim was his theory of belief – his theory that belief is a habit or disposition or preparedness to particular action expected to satisfy the purpose of that action (EPII: 139). How is this theory of belief justified? Why think that this is what belief is, or that this is all belief is? Peirce wrote that he thought this because of a “psychological principle”. What does this mean? It means that the nature of belief is understood psychologically, is understood from the standpoint of the believing subject. Before Wittgenstein and speech act theorists, Peirce says that to understand belief in this way is to understand it as “laying a wager”. So, for example, if I believe the diamond is hard, in effect I bet you (or me) – I assert to you (or me) – that if I rub the diamond against a mirror, the mirror will be scratched but the diamond will be unchanged. Suppose this is true about me. Suppose that I do make this bet, or that I am disposed to make this bet in particular situations. Peirce recognized that this indicates something about me – it indicates something psychological – but suggests that because the act of wagering or asserting is very different from the act of apprehending meaning “we cannot expect that any analysis of what assertion is or any analysis of what judgment or belief is, if that act is at all allied to assertion, should throw any light at all on the widely different question of what apprehension or the meaning of a proposition is” (EPII: 140). Peirce did not give up his theory of belief; instead, he came to believe that this theory in no way constitutes a proof of pragmatism, of the maxim of pragmatism.

If the pragmatic maxim is to be shown true, then it must be shown true in some other, non-psychological way. Of course, it may not be true, and so Peirce treated it as a hypothesis here. How should we think of the meaning of an idea? In a few paragraphs, Peirce massively expands the scope of this inquiry. He claims that what we ought to think – logic – depends on what we ought to do – ethics. And that what we ought to do depends on what is admirable (in itself) – aesthetics. Finally, these normative sciences, sciences of real goods, depend on an account or description of reality – phenomenology. (Here Peirce took pains to make clear that his phenomenology is quite different from Hegel’s phenomenology which he viewed as fatally nominalistic, “pragmatoidal”, and limited to analysis of actual experience (EPII: 143)). Any justification (or rational rejection) of pragmatism, Peirce announced in this first Harvard lecture, depends upon a phenomenology first and then an account of normative sciences.

What is? What are the universal categories of phenomena? There are *three*: Firstness or the quality of feeling or felt immediacy, Secondness or struggle or opposition and reaction and difference and facticity, and Thirdness or mediation or continuity or representation or intelligibility. This generates seven different and logically distinct phenomenologies: monist philosophies of A or B or C, dualist philosophies of AB or BC or CA; and a triadic philosophy, like that of

Peirce, of ABC (EPII: 149). Peirce took some care to repel reductionist attacks from perspectives of other phenomenologies – e.g., the Hegelian phenomenology and its insufficiently robust understanding of Firstness and Secondness (EPII: 177). And, he also claimed, each of the three categories may be further subdivided – as, for example, Thirdness may be understood in terms of icon, index, and symbol (EPII: 163). Finally, in “The Seven Systems of Metaphysics”, he argued that his three categories are categories of phenomena and not merely categories of thought. Why think Thirdness, Firstness, and Secondness (EPII. 181–96) are real and not just thought? In telescoped form and for the following reasons set forth in this order by Peirce: experience shows that general principles are operative in nature (EPII: 183); perceptual judgments presuppose percepts and the fact that these percepts are ineffable does not make them any less real; and, the experience of conflict with, or surprise at, the facts establishes the reality of Secondness (EPII: 194–5).

Having established a phenomenology that must be the basis for any non-psychological proof or rejection of pragmatism, Peirce worked back toward pragmatism by considering “The Three Normative Sciences” and their three goods. What is most interesting here are the theoretical presuppositions about theory and practice and, in turn, the practical implications of the normative sciences – practical implications that exist despite Peirce’s proclamations that theory and practice are separate and that it is not possible to serve both masters at once.²

If logic is a normative science that distinguishes good and bad with respect to representation, why should logicians be pragmatists? What is the proof of the pragmatic maxim? It appears to include two parts. First, Peirce claimed that all meanings constitute judgments that can be expressed in indicative sentences. Second, he next claimed that all judgments constitute imperative practical conditionals. For example, the judgment that the diamond is hard is the judgment that if (the conditional) the diamond is rubbed against a mirror (the practice), then it will scratch the mirror (the imperative). And Peirce took pragmatism to be a logic of meaning as imperative practical conditionals.

But why think that all judgments constitute imperative practical conditionals? Instead of responding to this demand for justification in terms of a psychology of belief, Peirce here provided a proof of pragmatism based on an account of perception and aims. The key to this account is Peirce’s claim that perceptual judgments arise (without self-control) from sensation through an abductive reasoning in which percepts are categorized by means of practical conditionals and

² See Stuhr, John J. 1994. *Rendering the World More Reasonable: The Practical Significance of Peirce’s Normative Sciences*. In Herman Parret (ed.), *Peirce and Value Theory*. Amsterdam and Philadelphia: Johns Benjamins Publishing.

their aims. For example, my perception that that (before me) is a diamond requires my reasoning that because it scratches glass and because all diamonds scratch glass, therefore, probably, that is a diamond. My perception, an irreducibly abductive faculty (EPII: 224), that that is a diamond falls under this practical conditional: If X is a diamond, X will scratch glass. Pragmatism, the pragmatic maxim, is the logic of this abduction, the logic of perception as well as the phenomenology of perception. Peirce added: it “fully covers the entire logic of abduction” (EPII: 235). That logic includes flights of imagination, so long as such flights ultimately alight “upon a possible practical effect” (EPII: 235).

The result of the practice of this logic is two-fold. It allows us to abandon unclear ideas; and, it allows us to make clearer ideas difficult to apprehend – particularly ideas of Thirdness (EPII: 239). This claim near the end of “Pragmatism as the Logic of Abduction” suggests a further transition in Peirce’s pragmatism and its justification: first a psychology of belief; next (and in these Harvard lectures) an account of perception; later in essays on pragmatism, a semiotic, a view of Thirdness as directly perceived (EPII: 240).

Near the end of “Pragmatism as the Logic of Abduction”, Peirce penned a passage well known to Peirce scholars – i.e., well known to a very small number of people. He wrote that “our logically controlled thoughts compose a small part of the mind, the mere blossom of a vast complexus which we may call the instinctive mind in which the man [who takes Thirdness to be directly perceived] will not say he has faith because that implies the conceivability of distrust, but upon which he builds as the very fact to which it is the whole business of logic to be true” (EPII: 241). And then Peirce concludes that “it is in action that logical energy returns to the uncontrolled and uncriticizable parts of the mind:

The elements of every concept enter into logical thought at the gate of perception and make their exit at the gate of purposive action; and whatever cannot show its passports at both those two gates is to be arrested as unauthorized by reason. (EPII: 241).

This strikes me as a very helpful way to understand pragmatism – both Peirce’s pragmatism (or pragmaticism) and James’s pragmatism, and also the views of later pragmatists. Concepts must exit thought through the gate of purposive action. They must issue in, and be justified by, the purposes and results of action.

When one reflects slowly and fully on this Peirce, told his audience as he concluded with confidence his series of lectures at Harvard, one will find the time spent “not altogether wasted” (EPII: 241). Students of the history of philosophy, moreover, I think, will find that they must imagine the prisons of reason as terribly over-crowded with arrested philosophers.

Patricia Turrisi¹

61 Peirce's Method of Work

You may perhaps gain some useful hints if I describe to you how I go to work in studying philosophy. (MS 312, 1903).

Peirce's 1903 Harvard Lectures on *Pragmatism as a Principle and Method of Right Thinking* were the occasion for seven lectures Peirce struggled to make accessible to an audience he believed was unprepared to follow "true, modern, exact, non-psychological logic" in "minute" terms. In Lecture V, he reveals the inconsistency between his audience's expectations that he provide "generalizations" and his own expectations of his work as performed according to his method (EPII: 525, 205–206).²

Writing for himself, Peirce engaged in a process of inquiry, acting as the interpreter of objects of inquiry (that is, of philosophical questions), the producer of signs of the object of inquiry (written accounts of results at each stage outlined in his method), and the interpreter of the signs he produced throughout the stages of inquiry (inferences drawn from writings on the object of inquiry). His practice of producing multiple versions of an essay, lecture or extended treatment of a topic is best understood as the expression of semiosis – the "tri-relative cooperation of interpreter, sign and object" rather than merely the attempt to perfect a manuscript for publication or performance (EPII: 411).

The wave of scholarship beginning in the 1970's giving explicit attention to Peirce with respect to his own historical and intellectual context has produced projects and editions that are of inestimable value. At the same time, a great quantity of unpublished work offers yet more opportunities for significant discoveries by readers who approach it with an awareness of how he worked. Such awareness is useful to readers of published works as well insofar as it alerts them to the expectation of philosophically rich alternative versions to any one current edition. Peirce offers a key to his manner of work in the first section of Lecture V of the 1903 Harvard Lectures in the following outline.

- a. You may perhaps gain some useful hints if I describe to you how I go to work in studying philosophy. I shall merely sketch the outline of the proceeding without going into details. I mostly work pen in hand and although important steps are taken while I am away from my writing-table, they are recorded at once.

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² Draft versions of the method from MS 311 and MS 312 may be found in *Pragmatism as a Principle and Method of Right Thinking* on pp. 41–46. MS 312 is the final draft excerpted here, on pp. 205–207.

- b. A given question in philosophy comes up for discussion, never mind how. I begin by writing out a collation upon it. That is, I begin by setting down briefly yet sufficiently and as formally as possible all the arguments which I have seen used on the one side or which seem to me likely to be used on that side; and then I do the same for the other side. Such of the arguments as admit of ready refutation, I at once set down the refutations of.
- c. Next, without going into the merits of the case, I draw up a list of the general methods in which a solution of the problem might be sought. If some of them appear to be quite futile, I draw up brief formal statements of the reasons of this futility.
- d. One of the methods will appear to me to be the one which ought to be decisive, and I carefully set down the reason why keeping a good look out for special circumstances which might annul this reason. Other methods may appear to me to have a secondary utility and I further set down the reasons for this and for my estimate of just how far and where those methods are valuable. Search is made for objection to all these reasons, and any that seem considerable are formally set down and refuted.
- e. But if, in this course of this part of the discussion or at a later stage, it appears that the question in hand depends upon another which I have never submitted to any systematic examination or concerning which, since my last examination of it any considerable ground or doubt have been found, I put aside the first examination until this other question shall have been at least provisionally settled in my mind.
- f. If no such interruption takes place, I take up first the principal method and afterwards the subsidiary or secondary methods and apply them with the severest critical scrutiny of which I am master, setting down always brief and formal but sufficient statements of all the steps of the argumentation, and disposing of all objections either by assent or refutation. I also dispose, in the same way, of all the arguments which have not already been disposed of. Having this brief drawn up I study it with the minutest care to detect any loop-holes, and sometimes amend it more or less radically and even giving the question itself a new and broader turn, and this is sometimes done three or four times over, before I am satisfied with the discussion.
- g. I then put the paper away and dismiss the matter from my mind. Sometimes I do so in despair of being able at the time to obtain any clear light on the subject; for when such light is not at hand my experience is that hard thinking is of very little use. There is nothing to be done but wait until the light comes from some other source . . . In fact, after a long time, something or other flashes a new light on the old question, and only too often I find that strenuous as was my scrutiny of the previous arguments, I have committed some horrible stupidity.

- h. At last, my ideas seem ripe for a new setting of them in order; and I make a second collation of the question without looking at the first but endeavoring to proceed quite as if the question were a new one. This second collation is drawn up just as the first one was, only,
- i. When it is complete, I get out the first and compare the two with minute criticism, both where they differ and where they agree.
- j. It may seem to me best to allow the matter to go over for a third collation, but commonly I consider that I am now well started upon the right track; or at any rate all that can be done in this way has been done.
- k. I impress the cardinal considerations on my mind, and perhaps draw up a note of anything difficult to bear in mind exactly; and I then look upon all the labor so far performed as a mere exercise of no value, except in the parts which have impressed me.
- l. It now remains to treat my conception of the problem like a seedling tree, which must have water, nutriment, sunlight, shade, and air and frequent breaking of the ground about it, in order that it may grow into something worthy of respect. These operations I also carry out, pen in hand, with intervals of digestion; and by drawing up new statements at irregular intervals according to the state of my reflections, but probably averaging a year in length, after I have made from half a dozen to a dozen of these, I begin to feel that I have carried the discussion as far as I am likely ever to do. There is no single logical point in the present lectures, for example, however small, which has not undergone at least four such digestions, and most of them a dozen or more.

Peirce concludes,

... The expression "swift as thought" ought to gain for you a new meaning as applied to my thought. Anybody who knows how I think, as I myself do, must be impressed by my awful stupidity. But I am fortunately capable of a vast amount of drudgery, and I never lose confidence that I shall ultimately accomplish any intellectual task that I set myself provided I live long enough.

Mathematical Exactitude

Kenneth Ketner notes that Peirce's ambition for the 1898 Cambridge Conference Lectures and onward, his "special business", his "most original intellectual contribution" was "to bring mathematical exactitude, [meaning] modern mathematical exactitude into philosophy, and to apply the ideas of mathematics in

philosophy” (1992 Peirce 2).³ Peirce was undoubtedly concerned with customarily mathematical matters as they related to non-mathematical topics, for example, the discovery of patterns, structures and their meanings, the nature of continuity and discontinuity, the principles of change, the nature and scope of relations between and within entities, and sufficient conceptions of reasoning and proof. Methods he might have considered likely to be useful to apply to philosophical questions are those that had served well in addressing mathematical questions. In his own method, he practiced the symbolic manipulation of expressions by continuously re-configuring collections of arguments from their disorganized beginnings to the solution, analogous to the mathematical method of a calculus. In the context of philosophy, an “argument” is the expression of an inference, but in mathematics, an “argument” is a variable whose input changes the value of the function in which it operates. Mathematical arguments are restricted in their domains, that is, not every input into a function is appropriate for that function but those in its domain are. And, the value or result of the calculation of an argument’s input in a function may become the argument in yet another function. Under this definition of “argument”, Peirce’s discussion of arguments resembles nothing more than a review of variables in terms of their appropriateness to the domains of functions that determine steps of a solution to a philosophical question, and methods referred to in (c), (d) and (f) the means by which to identify the functions themselves and their relationship to one another in their stepwise arrangement of a solution to a philosophical question. This is not to say that Peirce reduced philosophical ideas to inputs and outputs, but rather to emphasize the character of his goal of exactitude in philosophy. Elsewhere, Peirce developed cotary propositions of logic, which he likened to “*cos, cotis*, a whetstone” suggestive of stone *calculi* in their primitive form as reckoning stones (Peirce 1997: 241)⁴. In each new response to a philosophical question, the line of argument is focused anew until no further refinement can be made nor quality of organization enhanced. When Peirce finds himself with nothing more to investigate, he stops. A philosophical inquiry is more likely to come to a halt as a result of the investigator than because there is no more to be learned or said.

³ Peirce, Charles Sanders. 1992. Reasoning and the Logic of Things. Kenneth Laine Ketner (ed.), Cambridge, Massachusetts: Harvard University Press. Letter to Francis Russell, 23 September 1894.

⁴ Peirce, Charles Sanders. 1997. Pragmatism as a Principle and Method of Right Thinking. Patricia Turrisi (ed.), Albany: State University of New York Press.

Three Kinds of Reasoning

Peirce's method of work requires agile transitions between different modes of thought. Once past the first collation of arguments and methods, Peirce thoroughly evaluates their significance for the question at hand. Afterwards, sometimes hard thinking has no effect on his ability to "obtain any clear light on the subject". Light "from some other source" must arrive in its own time. Inevitably, "something or other", abduction, "flashes a new light on the old question", a rearrangement of matters, revealing a mistaken understanding attached to results obtained in the previous work. But even at the start of the process, the formation of the philosophical question involves abduction – "A given question in philosophy comes up for discussion, never mind how". Peirce isn't *assigned* a given question. He reasons that a certain question has yet to find a sufficient solution, moreover, that investigation into the question is likely to yield a sufficient solution. The first instance of reasoning is mere conjecture since the method itself is needed to evaluate whether any of the possible solutions is sufficient. The second is an estimate, not strictly based on known calculations, of whether the inquiry is more worth the resources needed to address it than other inquiries. Both are abductive inferences. In deciding where to start a review of collated methods, Peirce claims that "one of the methods will appear to me to be the one which ought to be decisive" (d). This method has not yet shown itself to be decisive. Is his guess correct? Guesses do not warrant themselves. Their tests lie in the application of other forms of reasoning. Peirce adds, "and I carefully set down the reason why[,] keeping a good look out for special circumstances which might annul this reason". (d). In other words, he composes an argument approximately thus

If the method is most decisive, certain desirable events occur.

The method is most decisive.

Thus, certain desirable events occur.

In order to examine the efficacy of the method under the possibility of counterexamples. Should no special circumstances be found that make the occurrence of certain desirable effects impossible, the argument in support of the method succeeds. But does experience bear out the conclusion necessitated by the premises? A deduction is a prediction about what we will find. The inductive process of reasoning finds the ratio of the frequency with which the logically necessary results determined by deduction do in fact occur. However, the experiential requirement of performing inductive reasoning has Peirce leaving the philosopher's study and taking a turn out of doors. He will now treat his conception of the problem as "a seedling tree, which must have water, nutriment,

sunlight, shade, and air and frequent breaking of the ground about it, in order that it may grow into something worthy of respect". His seedling will be known by the consequences of its exposure to the world, its experiences in the world, and by the fruit it bears.

“Provided I Live Long Enough”: Peirce as Interpreter and Interpreter of Interpreters

Describing the method of science in “The Fixation of Belief”, Peirce claims it is necessary for there to be a means by which “our beliefs may be determined by nothing human, but by some external permanency – by something upon which our thinking has no effect” (EPI: 120). External permanency is *external* insofar as it is “something which affects, or might affect, every man” despite various individual conditions under which inquirers experience this permanency. The premise of scientific method is that every inquirer is affected according to regular laws that we can ascertain by reasoning. Any individual, *given sufficient experience and taking the effort to reason* about that which is real “will be led to the one True conclusion” (120). Human limitations make an economy of research necessary – an individual unaided by others is suffers restrictions on time and other resources that make the lowest yielding inquiries untenable, as reflected in Peirce’s summary dismissal of methods that “appear to be quite futile”. Other impasses are not permitted to block the inquiry in general and Peirce deals with them either by shelving them temporarily or for good. He alternately broadens, and then minutely narrows his focus in order to explore the object of inquiry under different lights, in new circumstances. It’s evident that he changes roles in order to occupy the relative positions of as many inquirers as possible, playing both arguer and opponent, substantiating, refuting, re-formulating, and re-testing – as other interpreters would, and as Peirce, the interpreter of interpreters, does.

Reading Peirce Manuscripts as Representations of Relations between Interpretations of Objects

Those who have had the privilege of studying Peirce’s manuscripts may feel as if they are visiting a fractal world. A reader is likely to encounter uncanny recursions and strange loops that traverse seemingly unrelated topics, time periods and catalogue categories. Indeed, published editions establish their authenticity

only by scrutinizing multiple drafts and revisions to find the structure of the work as a whole. The editing challenges presented by a small sample of editions of Peirce's lecture series will suffice to demonstrate what I mean. *Reasoning and the Logic of Things* consists of eight lectures derived from eleven manuscripts, the editor acknowledging that, since it is not a critical edition, deletions were not shown except in some of the longer passages and in cases where they seemed significant (Peirce 1992: xi). The editor suggests that it would be useful to produce a volume of the unused drafts (2). *Pragmatism as a Principle and Method of Right Thinking* consists of seven lectures for which there were a total of sixteen drafts. Deletions were treated similarly in this volume, but unused drafts were excerpted and included in the text as a means of demonstrating the development of concepts original to these lectures. The eight 1903 Lowell Lectures on "Some Topics of Logic" are associated with forty manuscripts. More ambitious projects require massive editorial organization. The Peirce Edition Project founded in 1976 has published a mere eight of the thirty projected and one hundred possible volumes of "a comprehensive edition of Peirce's writings organized chronologically and edited according to current scholarly practices" though "a mere eight" does not do justice to the respect paid by its international team of scholars to the intellectual, historical and textual accuracy required to extract, authenticate and produce each of the documents in their appropriate order in each volume.⁵

Rather than give us cause for regret at the labor required to establish definitive versions of his philosophical works, understanding of Peirce's method of work gives readers opportunities to see individual writings as deliberately exact moments of development of often lifelong philosophical concerns, and the collection of writings as internally connected in ways we have yet to discover.

⁵ Peirce Edition Project <http://www.iupui.edu/~peirce/index.htm> extracted November 24, 2013.

Paul Cobley¹

62 Metaphysics of Wickedness

[I]f any signs are connected, no matter how, the resulting system constitutes one sign; so that, most connections resulting from successive pairings, a sign frequently interprets a second in so far as this is married to a third. Thus, the conclusion of a syllogism is the interpretation of either premises as married to the other, and of this sort are all the principal translation processes of thought. In the light of the above theorem, we see that the *entire thought-life of a person is a sign*; and that a considerable part of its interpretation will result from marriages with the thought of other persons. *So the thought-life of a social group is a sign; and the entire body of all thought is a sign*, supposing all thought to be more or less connected. (MS 1476: 38, 1904).

To extrapolate from a statement such as this in the way that I and the co-contributors to this volume have done carries with it significant risks. There is a tendency in the co-opting of major thinkers to play the game of ‘find the quote’, as if the thought of such prolific writers of unpublished texts as Aristotle, Leibniz, Gramsci and Wittgenstein is a system which allows cherry picking. Peirce has been no exception to this tendency over the years, often without due respect to the major changes and developments in the course of his thought. Yet, those wishing to study Peirce seriously or to bring the flavour of his work to bear on their own research have an advantage. This advantage resides in Peirce scholarship’s generation of a good number of excellent books (see, especially, the Preface to this volume) which have drawn out currents from Peirce’s almost unmanageably disparate *oeuvre*. Often, the best books, from different ages of Peirce scholarship, have been very short: Gallie (1952), Greenlee (1973), Savan (1987–8) and de Waal (2001). Perhaps the best of all of these is Colapietro (1989) which consistently allowed Peirce’s approach to the nature of personhood to emerge at a time when sign study found itself between the textualism which became the main focus of poststructuralism’s critique of semiotics and just before the blossoming of the biosemiotic perspectives which rendered post-structuralism largely spurious. In this work Colapietro was, as Marcus (2000) has said of Sebeok, the right man in the right place at the right moment. His work proceeded with a profound understanding of the heritage of European thought after structuralism, it was located in Peirce studies (and semiotics) and appeared at precisely the moment that semiotics needed renewal.

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The quote from Peirce's MS 1476, above, and this brief discussion of it that follows, amount to a mere footnote to Colapietro. Nevertheless, there is a need to be explicit about the implication of the thought-life of a social group being a sign and to add some observations on what Peirce's approach to the self has bequeathed to semiotics twenty-five years after Colapietro's book and a hundred years after Peirce's death. The quote from MS 1476 bears on a number of key issues in semiotics of the last two decades. It pertains to the relation of sign and texts, how the sign systems which constitute the latter can be taken to amount to a 'sign' in themselves among the tissue of systems that make up a semiosphere. It raises the question not only of how signs have significatory effects but also how texts maintain their effectivity simultaneously with other texts. It sees logic as semiotic with signs to be understood in a process of translation rather than in a relation of structural value. Most importantly for the present discussion, it shows that 'thought-life' is experienced 'in' a person but is always distributed across a social group.

It is this last perspective that Colapietro so deftly draws out from Peirce. In the modern literature concerned with the human subject there is often a tension between what is referred to as 'selfhood' and what is understood as 'subjectivity'. The former, broadly, involves a conception of the human as *conscious* of its own existence and most of its intellectual capacities as well as its distinction from others; the latter, generally, has come to mean the human as *constituted* by the range of 'practices' which precede its existence and subsequently – or 'always already' – shape its thought processes and options. Such practices are semiotic in their bearing, involving the signs that humans use and inhabit in their existence. What has probably become axiomatic in much of the writing on identity, the subject and the self in modernity is that subjectivity and selfhood are synonymous mainly because none of them are any longer considered to be unitary or intrinsically constituted in character. As Colapietro shows, Peirce's formulations regarding personhood embrace a similar problematic. In pages that are quotable (far more so than Peirce) at almost every sentence, Colapietro sets out the erstwhile view of the Peircean self as almost negligible in the face of synechism and semiotic, as against the agentive, first-person experience of selfhood which is adumbrated in a number of neglected passages from Peirce and is a necessary complement of the 'semiotic' self.

Colapietro identifies three moments where Peirce places his strong synechistic view of personhood within an understanding of 'inwardness' and agency: the *Journal of Speculative Philosophy* articles of 1867–1868, the series of articles in *The Monist* from 1891, and the later writings on pragmatism. "In connection with this last moment", writes Colapietro, "I shall show how Peirce's notion

of the self provides a basis for autonomy – in particular, for the level of self-control that distinguishes the human animal from other animals (5.533)” (1989: 68). This he duly does, discussing how the semiotic (but ‘negative’) account of the self in Peirce is imbricated with a positive (but ‘mentalistic’) account. Through a nuanced discussion of Peirce’s concepts of the individual, substance, organism and mind – a discussion that cannot be replayed here because of space limitations – Colapietro persuasively argues that Peirce’s early account of the self as a semiotic process and his later portrait of it as an autonomous agent fuse in a “vision of the person as an agent *through whom* the ideal of reasonableness becomes more concretely embodied in habits and institutions, in individual character and social context” (1989: 97).

The reason that Colapietro’s intervention came at precisely the right time is because Anglophone semiotics was floundering in the late 1980s, caught in the consequences of the apparent textualism that his book expertly and sympathetically identifies in the influence of Eco, an avowed Peircean. Meanwhile, the ‘continental’ thought in the wake of structuralism that appeared to be making the running, especially in US universities, was underpinned by a take on selfhood that was closely related to textualism. Drawing out the Peircean self, Colapietro contributed to the new terrain of theory on which agency could be discussed in the 1990s, citing Peirce’s “refusal to eliminate the acting subject along with the Cartesian cogito” as “one of the important respects in which Peirce’s semiotic vision is superior to the antihumanist orientation of Saussure’s structuralist and poststructuralist offspring” (1989: xix). This last statement was certainly true of some aspects of poststructuralism. Lacan, for instance, whose influence has declined drastically in the interim, paints a picture of the human subject as captive in the quasi-Saussurean ‘pure differentiability’ of ‘language’ (Cobley 2008). It is this captivity which underlies Lacan’s contention that the attempts of humans to make reference, to gain meaning, are illusory and is typical of poststructuralism taken generally. Yet, two related points should be added in respect of the new terrain of theory. Firstly, the ‘anti-humanist’ perspective on selfhood, in truth, resides in the ‘structural Marxism’ of Althusser and others rather than in Saussure’s poststructuralist offspring. It is the view of humans as the ‘bearers’ of structures to which E.P. Thompson (1978) and other humanists objected so vociferously. Secondly, poststructuralism was actually partly responsible for spawning a version of the agentive self that came to the fore in so-called ‘postmodernism’ during this period, a vision of personhood based on ‘identity’ rather than subjectivity and, to varying degrees, complicit with neo-liberalism, particularly in respect of the idea that personhood could

be constituted autonomously through consumption (see Ponzio 2005 for a critique of these concepts).

Towards the centre of *Peirce's Approach to the Self*, Colapietro gives a very cogent account of the logical, semiotic, even antihumanist, framing of the subject by Peirce. He contrasts Peirce's semiotic subject – “‘There are some small particulars that a man can keep to himself. He exaggerates them and his personality sadly’ (8.81; MS 1099, 00009)” (1989: 62) – with James' individualistic confounding of “thoughts with feeling-qualities”. He also notes Peirce's contention (8.82) that “To deny the reality of personality is not anti-spiritualistic; it is only anti-nominalistic” (1989: 63–4) in that nominalism rests on a notion of the self as unknowable. Possibly Peirce's strongest statement of this semiotic position on the self is to be found in ‘Immortality in the light of synechism’ (MS 886 [1893]; *EPII* 1–3) which Colapietro also discusses. Here, Peirce is unequivocal about what is entailed for the subject in synechism. Colapietro quotes from the passage that has since appeared in the second volume of *The Essential Peirce*:

Nor must any synechist say, ‘I am altogether myself, and not at all you’. If you embrace synechism, you must abjure this metaphysics of wickedness. In the first place, your neighbors are, in a measure, yourself, and in far greater measure than, with deep studies in psychology, you would believe. Really, the selfhood you like to attribute to yourself is, for the most part, the vilest delusion of vanity. In the second place, all men who resemble you and in analogous circumstances are, in a measure, yourself, though not quite in the same way in which your neighbors are. (*EPII*: 2).

Tellingly, Peirce then goes on directly to refer to “the barbaric conception of personal identity” (*EPII*: 3). The dramatic expression here indicates the depth of feeling about the issue and can be extended by acknowledging that the closest embodiment of the object of Peirce's ire is what is elsewhere called ‘liberal humanism’.

The strength of Peirce's renunciation in this passage indicates the pervasive nature of both philosophically standard accounts of selfhood and the common, demotic understanding of the self that makes up quotidian lived relations and which he felt compelled to oppose in no uncertain terms. Twenty-five years on from Colapietro's informed and targeted call for a more balanced appraisal of Peirce's approach to the self and its capacity to transform the study of subjectivity, this semiotic constitution of the self in collectivity still demands to be re-visited – again and again, if necessary. In the midst of the global financial crisis and, especially, in the wake of the banking scandals of the last decade, there is, much more than ethics in general, a fundamental need for the continuity of thought-life to be a part of common sense. Perhaps the spate of subprime lending at the

turn of the 21st century will go down in history as one of the classic denials of the understanding that all thought is connected. However, there is, in the quote from MS 1476, an indication of how such denial can inform erroneous individualist concepts of selfhood, for the *entire thought-life of a person* and the *thought-life of a social group* and *entire body of all thought* are all signs, albeit of much different types.

Synechism is inexorably a philosophy of collectivity to which individualism and its p.r. wing, liberal humanism, are anathema. For some critical thinkers, particularly those weaned on materialism, it can incite squeamishness because it renders collectivity synonymous with (spiritual) communion. The evidence that collectivity and communion are as one for Peirce is well known and is exemplified by his insistence on “marriages with the thought of other persons” and the assumption that all thought is “more or less connected”. In the UK, in particular, this kind of folk or ‘mystical’ socialism in which collectivity is wedded to religious communalism is evident in the endeavours of such figures as Robert Owen, William Morris, and its residue might even be found in the work of Raymond Williams. The contemporary critique of liberal humanism in *The Whole Creature* (2006), the book by my colleague and friend, Wendy Wheeler, and partly inspired by Peirce, has something of this flavour. Notwithstanding the spiritual overtones of synechism, and while its harder, anti-individualist, edge makes its restatement particularly apposite in the present moment, the necessity of incorporating first person experience into all formulations on subjectivity remains. This is the case regardless of how much has changed since the publication of Colapietro’s book, simply because there has been a long history in bourgeois thought which has privileged first person experience by default. As such, critical thinking on subjectivity finds the carpet pulled out from beneath itself at the outset. With the option of reiterating that it is a sign, “The self is truly something unique and irreducible in itself”, Colapietro (1989: 74) therefore succinctly concludes, “but what it is in itself is only revealed or, more accurately, realized through its relations to others”. Contemporary semiotics now works with assumptions about selfhood which suggests that the period of textualism is largely banished from memory. While some leftist thought has been overly credulous about the first person (humanist Marxism, milled under the carborundum wheel of its own theoretical contradictions) or steadfastly resistant to it (Stalinism, sustained only by terror and the cult of personality), work on Peirce will continue to offer a critical prospectus on subjectivity through its analysis of logic (the semiotic) interacting with the agentive (person).

Acknowledgements

This short essay is dedicated to Jørgen Dines Johansen who supplied me with the MS 1476 quote in 2004 and Vincent Colapietro who supplied the inspiration for Peircean-informed work on subjectivity much earlier.

Daniel J. Brunson¹

63 A Pragmaticist Appreciates the Past

Pragmatism consists in holding that the purport of any concept is its conceived bearing upon our conduct. How, then, does the Past bear upon conduct? The answer is self-evident: whenever we set out to do anything, we “go upon”, we base our conduct on facts already known, and for these we can only draw upon our memory. It is true that we may institute a new investigation for the purpose; but its discoveries will only become applicable to conduct after they have been made and reduced to a memorial maxim. In short, the Past is the sole storehouse of all our knowledge. When we say that we know that some state of things exists, we mean that it used to exist, whether just long enough for the news to reach the brain and be retransmitted to tongue or pen, or longer ago. Thus, from whatever point of view we contemplate the Past, it appears as the Existential Mode of Time. (CP: 5.460, 1905)

This dense passage reflects the almost fractal nature of Peirce’s writing, wherein each part expresses the structure of the whole. On the first level, this paragraph is an illustration of the pragmatic method, used to clarify the notoriously unclear nature of Time. As Peirce goes on to apply this method to the nature of the Present and the Future, with each understood as a different mode of time, we see also an articulation of Peirce’s triadic scholastic realism. That is, this pragmatic analysis offers resistance to those who might misidentify or reduce the primary categoreal element of one mode of time to another, such as the common move of attempting to explain the past only in terms of the present. Finally, there is a novel presentation of Peirce’s fallibilism in the insistence on the necessity of creating memorial maxims, for “. . . the deceptions and inexactitude of memory are proverbial” (CP 1.146). In what follows I will briefly place this passage concerning time in the context of its own time, and then offer some remarks on the metaphysical and epistemological lessons implied here.

This pragmaticist analysis of time comes from the series of articles published in *The Monist* from 1905–1906, starting with “What Pragmatism Is”. Peirce (re)enters the debates surrounding pragmatism by affirming the experimentalist mindset of a person trained in a laboratory as the basis for the pragmatic maxim. Furthermore, in response to the adoption of ‘pragmatism’ by thinkers such as William James, F.C.S. Schiller, and other, more ‘literary’, kidnappers, Peirce rechristens his original formulation as *pragmaticism* (CP 5.414). The quote above comes from the second essay, entitled “Issues of Pragmaticism”, with ‘issues’ meant in the dual sense of ‘problems’ for and ‘consequences’ of pragmatism. Furthermore, as Vincent Colapietro notes, “It is significant that in ‘Issues

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of Pragmaticism', an essay following the lecture in 1898 ('Philosophical Conceptions and Practical Results') given at Berkeley by William James, Peirce focuses on time" (8). I suggest that this focus is significant for at least four reasons:

- 1) Peirce's original expression of the pragmatic maxim in "The Fixation of Belief" (1887) and "How to Make Our Ideas Clear" (1888) uses examples such as hardness, weight, and force, eminently practical and scientific concepts. Here, however, Peirce chooses Time, a move which can be seen as a subtle rebuke to those pragmatists who unpragmaticistically believe that the pragmatic maxim does away with metaphysics entirely.
- 2) While the selected passage concerns the past, Peirce analyzes all three modes of time², and thus seeks to avoid the nominalistic errors expressed by the 'overfuturism' or 'overpresentism' of some pragmatist thinkers. As summarized by Sandra Rosenthal: "Moreover, the most unfortunate situation for pragmatism, for [Robert] Neville as for [Paul] Weiss, is its inability to give an account of past things, for while the future collapses into a mere conditional projection of the present, the past has its reality only as a possible object of interpretation and is, like the future, reduced to its role in possible interpretation, which is an activity in the present" (2000: 120).
- 3) Peirce's rejection of thin conceptions of temporality as inconsistent with pragmatism is also targeted at those 'scientific' metaphysicians committed to what we would call 'hard determinism', and Peirce calls 'Necessitarianism': "Your Necessitarianism is a theoretical pseudo-belief – a make-believe belief – that such a sentence ['I *can* do this or that as well tomorrow as today'] does not express the real truth. That is only to stick to proclaiming the unreality of that Time, of which you are invited, be it reality or figment, to consider the meaning" (CP 5.459). Here the emphasis on 'can' again evokes the pragmatist insistence on real possibility.
- 4) Peirce's explicitly allies his pragmatist clarification of time with the recharacterization of his philosophy as a Critical Common-Sensism, as expressed in the first half of "Issues of Pragmatism". For example, in his account of the present Peirce argues that "... the attitude of the present instant (according to the testimony of Common Sense, which is plainly adopted throughout) can only be a Conative attitude" (CP 5.462). This places pragmatism as a rapprochement of two post-Humean strands of philosophy: the Scottish Common Sensism of Thomas Reid, and the Critical Philosophy of Immanuel Kant.

² See also Helm 1985: 28–32.

Again, we can see that this passage and its context touches upon a tremendous variety of Peirce's mature philosophical commitments, and especially the evolutionary metaphysics proposed as his guess at the riddle of the universe.

While this is not the place for a complete exposition of Peirce's metaphysics, one further point deserves mention.³ That is, Peirce believes that the reality of memory provides a kind of proof for *synechism*, “[t]he tendency to regard continuity ... as an idea of prime importance in philosophy ...” (CP 6.103). This proof is a simple *modus tollens*: “The argument which seems to me to prove, not only that there is such a conception of continuity as I contend for, but that it is realized in the universe, is that if it were not so, nobody could have any memory” (CP 4.641). But we do have memory; thus *synechism* is true.⁴ More fully, common sense – understood as to include both ‘folk psychology’ and universal experience – contends that we do have memory, along with associated functions such as inference, learning, and synthesis (CP 1.376). Memory presents itself as an immediate (re)presentation of some past event or object, with some element of self-certification that remembering a prior experience is evidence that the prior experience was in fact had. Now, the details of the epistemology and psychology of memory are complex and contested, but the most common approach is some form of presentist representationalism. This means that while memories are representations (‘images’ in some sense) of putatively past objects, they themselves are wholly present. In the words of Bertrand Russell, a paradigm of this approach to memory: “... everything constituting a memory-belief is happening *now*, not in that past time to which the belief is said to refer” (1921: 159). Instead, memories are as present as any other image, and so what distinguishes them from other kinds of present images is nothing more than a feeling of familiarity or pastness, or a degree of vividness midway between that of perceptions and imaginations. However, in reducing our relations to past (external) objects to present (internal) relations among images, the common view is no more than a variety of nominalism in Peirce's view, wherein only the present individual, or even the present moment alone, is real.

Here this account of memory shows itself to be inconsistent, for it presupposes some form of memory that allows me to be aware of this present memory-image, since awareness requires time: “We are immediately aware only of our present feelings – not of the future, nor of the past. The past is known to us by

³ See Forster 2012; Mayorga 2007; Parker 1998 & Reynolds 2002 for some important and recent explorations of Peirce's metaphysics.

⁴ Furthermore, establishing the truth of *synechism* is an essential component of Peirce's proof of pragmatism (CP 5.415). See also Fisch 1986; McCarthy 1990; Roberts 1978; Robin 1997 & Turrisi 1992.

present memory, the future by present suggestion. But before we can interpret the memory or the suggestion, they are past . . .” (CP 1.167). Alternatively, one could treat the present as absolutely instantaneous, but this leads to an absolute scepticism, for in an instant there might be feeling, but no thought.

Peirce’s synechism, in contrast, asserts that cognition is a continuum involving the interaction of various modalities: “The present moment will be a lapse of time, highly confrontational, when looked at as a whole, seeming absolutely so, but when regarded closely, seen not to be absolutely so, its earlier parts being somewhat of the nature of memory, a little vague, and its later parts somewhat of the nature of anticipation, a little generalized” (CP 7.653).⁵ If we were truly trapped in the present instant, we would not even be able to communicate with ourselves, at least not in any rational, self-controlled, fashion. Thus, this pragmatist conception of time provides support for Peirce’s long insistence that all thinking occurs in signs, and that signs can, and do, grow.

Understanding time and cognition synechistically also supports Peirce’s fallibilism: “The principle of continuity is the idea of fallibilism objectified. For fallibilism is the doctrine that our knowledge is never absolute but always swims, as it were, in a continuum of uncertainty and of indeterminacy” (CP 1.171).⁶ Our knowledge is fallible because the insistentcies of the present, a present that consists mostly of the past, must be interpreted into memory before they can become the basis for meaningful conduct. “[Memory] is a wonderful power of constructing quasi-conjectures or dreams that will get borne out by future experience. The power of performing this feat, which is the power of the past, is a gentle compulsiveness” (CP 7.667). As the formation of a memory is an abductive process of abstracting or prescinding some elements of a perception, it is inherently and unavoidably fallible. And yet, through the gentle compulsiveness of the past, and the incorporation of future consequences, we can have more or less reliable knowledge of ourselves and of the world.

Intriguingly, Peirce suggests that what others see as the prime fault of memory – its susceptibility to the will – is its virtue. That is, when Peirce asserts that “[the perceptual judgment] thus only refers to a memory of the past; and all memory is possibly fallible and subject to criticism and control” (CP 5.554), many would think that being subject to control is what *makes* memory fallible. However, while the varying gentle compulsiveness of the past does leave room for biases to influence the generation of memories and their recollection, if the past were more than gently compulsive it would be simply brute rather than

⁵ Peirce also refers to the application of synechism to cognition as the ‘serial principle’ (CP 7.638–58).

⁶ For a sustained engagement with Peirce’s fallibilism, see Cooke 2007.

intelligible. Furthermore, while we filter new experiences through our selves, future experiences provide a test of our interpretations, and this process could be accelerated through more self-controlled inquiry under normative ideals. Indeed, Peirce implies that the criticism and control of memory is self-control as such: “The past . . . is the *ego*. My recent past is my uppermost *ego*; my distant past is my more generalized *ego*. The past of the community is *our ego*” (CP 7.636). In other words, we each consist of the sum of interpretations of past experiences, experiences both personal and extrapersonal. Here the reality of memory offers a further lesson of synechism, for the continua that allow for cognition, the communication of past self to future self via present self, also allow for social cognition through the inheritances of our past. Of course, these inheritances include traditions to be resisted as well as those to be cherished, but nevertheless our ability to strive for greater, more concrete, reasonableness in the future rests upon the existence of the past in which we are ensconced. Thus, while “. . . a pragmaticist is obliged to hold that . . . the future alone has primary reality” (CP 8.194), ‘primary reality’ does not mean *sole* reality, and so a pragmaticist should also remember to appreciate the past.

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64 Peirce's Logotheca

Then we have mark, note, trait, manifestation, ostent, show, species, appearance, vision, shade, spectre, phase

Then, copy, portraiture, figure, diagram, icon, picture, mimicry, echo

Then, gnomon, clue, trail, vestige, indice, evidence, symptom, trace

Then, muniment, monument, keepsake, memento, souvenir, cue

Then, symbol, term, category, stile, character, emblem, badge

Then, record, datum, voucher, warrant, diagnostic

Then, key, hint, omen, oracle, prognostic

Then, decree, command, order, law

Then, oath, vow, promise, contract, deed

Then, theme, thesis, proposition, premiss, postulate, prophecy

Then, prayer, bidding, collect, homily, litany, sermon

Then, revelation, disclosure, narration, relation

Then, testimony, witnessing, attestation, avouching, martyrdom

Then, talk, palaver, jargon, chat, parley, colloquy, tittle-tattle, etc. (SS: 194, 1905).

Peirce wrote a review of Victoria Lady Welby's essay 'What is Meaning?' (1903) (SS: 157–159). Peirce's critical note was followed by a warmhearted correspondence (1903–1911). The letters with Lady Welby held for Peirce a central place of joy in the jeremiad of his final years. Lady Welby was a member of the English nobility, serving Queen Victoria as Maid of Honour, but working as general semanticist, developing her signification as a source of insight into the meaning of language (SS: 167–175). Their correspondence became for Peirce an intellectual stimulus, as he spread out his emergent framework of semiotics and linguistics to Lady Welby. Other than meeting each other in person, as the original plan was, their intellectual friendship was reduced to letters crossing the Atlantic. During their exchange of views, the pragmaticist Peirce shaped and reshaped his mastery of semiotic signs during the intellectual comradeship with the first woman semiotician.

In July of 1905, Peirce wrote an incomplete letter, never sent to Lady Welby, ending with the quote above. The emphatic words in italics are comparable when meaning "technical definitions" to emphasize the "varieties of signs" (SS: 194) within the words and sentences. The simplicity of the refractory words must be understood as marginal "synonyms". The signs are vaguely described in the course of Peirce's letter as "a character with the idea of being quite roughly like

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something, or the rough impression that experience of a thing leaves upon the mind” (SS: 194). Rather than a dictionary or encyclopedia, Peirce wrote a hypothetical list or catalogue of signs (Eco 1984, 1988, 2009: 36–48).

Peirce’s anagrams can breathe new life into the analytical list playing a large role in the different but “equivalent” propositions. Peirce defined the pragmatic scepticism as “the principle that every theoretical judgment is a confused form of thought” (CP 5.18). The transparency of the list must be “perfused with signs, if it is not composed exclusively of signs” (CP 5.448 fn.) arising from the further development of self-consciousness about one’s own symbolic representation. Thus the unclear (vague, indetermined) meaning could be transformed into a clear (distinct, determined) version (CP 5.393), if and when one follows Peirce’s advice and “turns over [to] the interpreter the right to complete the determination as he please” (CP 5.448 fn.). The moral (or Herculean) task of the interpreter “seems a strange thing, when one comes to ponder over it, that a sign should leave its interpreter to supply a part of its meaning” (CP 5.448 fn.). Managing to include in Peirce’s list a daunting variation of “same” synonyms with “utterly disparate kinds” of meaning, the attempt of the “policy-making” interpreter gives the hypothetical collection something like “a *single* idea; it must have a *unity*, because it is an idea, and unity is essential to every idea and every ideal” (CP 1.613).

The image of Peirce’s quotation introduces a series of 14 subordinate clauses, without punctuation in full stop or comma. The first sentence starts with “then we have” (and a combined total of 12 nouns), but is left out before the following 13 phrases to the short keyword “then”, without a following verb. At the head of each phrase, “then” is used as a conjunction with the next phrase. The fixed point at the head of each phrase exists to acknowledge the use of the italicized arrangement of the variations of nouns into sentences of different lengths. The sequence ends with the abbreviation “etc”. (SS: 194) to end the elliptic hypothesis (CP 2.316; MS 787).

Discouraging the meaning of noun-words, Peirce considered the noun as an unclear term, like an “empty shell” (MS 599: 10, 12, 14), which “does not *indicate* the object it denotes” (CP 2.287 fn. 1) and not “an essentially necessary part of speech” (CP 8.337), as the verb. The “incapacity” (CP 2.287 fn. 1) of the separate noun is “really nothing but a *blank form* of proposition . . . and a blank can only mean ‘something’ or something even more indefinite” (CP 8.183). However, the catalogue of synonyms suggests more than a neutral term (firstness), but perfuses into a meaningful proposition (secondness) “exciting in the mind some image or, as it were, a complete photography of images” (CP 2.317). The verbal proposition of the enumeration might perfuse further to the “ideal of conduct” (CP 1.591–1.615) of Peirce’s argument (thirdness), giving the conclusive

proof or evidence of the synonyms. This mental formula was argued in Peirce's October 1904 letter to Lady Welby (SS: 22ff.).

Peirce's list or catalogue is a hypothetical proposition, but, considering the multiplicity, the "utterly irregular infinity could probably be proved to involve a contradiction" (MS 599: 13). Changing this chaos into Peirce's "doctrine of clearness and distinctness (CP 5.392), the practical and theoretical questions seem split into two stories. In one story, Peirce had contemplated in 1894 a practical project to rearrange, refashion, and reconstruct the first edition of Roget's Thesaurus (1852) into his semiotic or pragmatic encyclopaedia, Peirce's Logotheca (MS L357: 8; see Brent 1998: 237f.). During the falling tide of poverty in Arisbe, Peirce tried to get down to business with George A. Plimpton, a New York publisher and bibliophile. Peirce's idea is illustrated in the incomplete MS 1135 ([1985] 1986), totalling 133 pages with rough and ready drafts or variants in the standard lexicon (Robin 1967: 133). The first edition of Roget's Thesaurus was "a simple notebook of words and phrases that Peter Mark Roget collected for his own personal use", remarking that the "First reactions to the book were mixed" (Davidson 2002: vii). Peirce's commentary set the tone with the title: "A very few slight specimens of defects of Roget" with the sardonic twist of the bracketed subtitle "(Got together by looking through the book 20 minutes)" (MS 1935: 2). Insisting that the ways of the world be learned by direct experience, rather than by manual reference to Roget's Thesaurus, Peirce rebaptized the title to "A Classification of Ideas and Words" (from MS 1135: 4). The unshackled intellect of his vision tamed the wilderness of synonyms, but the sketches of single words provided some evidence but no proofs, furnishing Peirce's hypothesis with a number of provisional "things".

The second story is yet more intriguing. Peirce wrote to Welby in October of 1904 that the puzzle (MS 599: 18) identifies the separate noun as an iconic "ornament of logic" (CP 5.392). In the quotation, the linguistic keywords or cultural clues (Gorlée 2012: 231–237) are combined "as if it were a character or mark (or as being so)" (SS: 34 = CP 8.337). The wide assortment of ideas seemed to grow into a lexicographical "cabinet of curiosities", awaiting Peirce's effort to apply or adapt the "antique bijou" in a meaningful reconstruction of the Wunderkabinett of changing the "sign" into "semiotic signs" (Gorlée 2012: 83).

The categorial solution, with the interaction of the dimensions of firstness, secondness, and thirdness, reveals most consistently the influence on Peirce's overall thought. In 1905, he divided signs into three classes of semiotic signs to give the pragmatic meaning of the (monadic) sign-in-itself according to the dynamical (dyadic) object and final (triadic) interpretant within his three categories working in actual experiences (MS 339C: 498; MS 939: 40). The guess in Peirce's quotation is not a tabular arrangement of three trichotomies, nor an

alphabetical list, but reflects the interactive motifs with subdivisions of the three elements, the genuine thirdness, the one degenerated in the first degree (involving secondness) and the second degree (partaking of firstness) (Gorrée 1990). Peirce proposed in the postscript to his letter to Lady Welby of October 12, 1904 that: “P.S. On the whole, then, I should say there were ten principal classes of signs” (SS: 35f.). At later dates, he modified the hypothetical division to twenty-eight, sixty-six classes, or considerably more classes of signs (Weiss/Burks 1945; Sanders 1970; Gorrée 1994: 62–66). The adventure of the classification of signs daunted Peirce, but he never reached a final end-point.

The refractory varieties of the word “sign” (SS: 35f.) stimulated Peirce’s “technical” strategy of semiotic signs to challenge the genuine and degenerate forms of possible sign-action in half-improvized semiosis. Starting with the six species of signs (MS 939: 40; see Sebeok 1999 [originally 1975]), Peirce started in his letter to Lady Welby (1905) with the zero-degenerate sign of “mark, note, trait, manifestation, ostent, show, species, appearance, vision, shade, spectre, phase” to present the outline of the contours of the visible sign in absolute firstness of the sign-as-it-is (pre-firstness). Next, the lines or limits of the sign’s bodily shape can occur in replica, repeating previous signs in “copy, portraiture, figure, diagram, icon, picture, mimicry, echo” (second and first of firstness). Subsequently, the sign can lose itself from the exact appearance, showing the track of “gnomon, clue, trail, vestige, indice, evidence, symptom, trace” (genuine secondness). To memorialize the sign of past persons, actions, or events, we keep the “muniment, monument, keepsake, memento, souvenir, cue” (first and second of secondness). The proper names of figurative objects or notions are formulated in the style of “symbol, term, category, stile, character, emblem, badge” (second and third of secondness). The documentary report refers to the information of “record, datum, voucher, warrant, diagnostic” (third of secondness), but the story can be degenerated from good to evil in “key, hint, omen, oracle, prognostic” (first of secondness).

From the demonstration of the informal degeneracy of desires and purposes, Peirce focused on the intellectual formality of thought-signs (MS 939: 41–50, including 5 variant pages). The series “decree, command, order, law” presents the authoritative decision with the force of law (genuine thirdness). The solemn act obeys the binding character of “oath, vow, promise, contract, deed” (second of thirdness). The subject matter called attention to the moral doctrine in the “theme, thesis, proposition, premiss, postulate, prophecy” of human meditation, composition, and reasoning (first and second of thirdness). Man’s personal quality is his request to God in “prayer, bidding, collect, homily, litany, sermon” as a cry for spiritual security (second and first of thirdness), while God enlightens man in the divine or sacred myths of “revelation, disclosure, narration, relation” (second,

first, and third of thirdness). Personal evidence in support of facts includes the “testimony, witnessing, attestation, avouching, martyrdom” to persuade the court or jury as to the truth of a witness (second and first of thirdness). Moving further from the truth, the series of “talk, palaver, jargon, chat, parley, colloquy, tittle-tattle, etc”. streams from public policy onto the front page of news in journalism, the informal speech of the town, or gossip, privy to human reflections (first of thirdness).

Peirce's glossarial index incorporated a number of nouns, derived from the original paragraphs of Roget's Thesaurus (1852 [used is 2nd ed. of 1853]), where the “sign” was a trivial term applied to indication §550, omen §512, record §551, write §590, prodigy §872, evidence §467, compact §769. In the paragraph of indication §550, “semiotics” was mentioned as “science of signs”. Peirce selected “technical” code words applying especially to precise the terms taken from hard and soft sciences, including medical and legal sciences, humanities, arts, religion, and spiritualism, implying medical, hunting, and forensic terms. Peirce had time to pick and choose among the terms of Roget's Thesaurus, without mentioning his logic of the genuine and degenerate signs.

By noting and recodifying, Peirce has largely made a logomachy of a new hypothesis, separating the (un)classified nouns taken from Roget's Thesaurus into “clearer notions of the lineage and relationship of the different maxims of rhetoric, such notions carrying with them juster judgments of the several extents and limitations of those maxims” (EPII: 328). Peirce's postscript has led a charge into the deep territory of inferential, expectative, and predictive semiosis. On this 100th anniversary of his death in 1914 (Brent 1993: 319f.), the memories of Peirce as “pioneer, or rather a backwoodsman, in the work of clearing up what I call semiotic” (CP 5.488) must be forever held in honour.

Jesper Hoffmeyer¹

65 Animals use Signs, They just don't know it

All thinking is by signs; and the brutes use signs. But they perhaps rarely think of them as signs. To do so is manifestly a second step in the use of language. Brutes use language, and seem to exercise some little control over it. But they certainly do not carry this control to anything like the same grade that we do. They do not criticize their thought logically. (CP 5.534, 1905).

The wider context for this quote is Peirce's discussion of pragmatism in volume five of the *Collected Papers*, but the immediate context is Peirce's claim that reasoning must be based upon ethics. This claim is itself based on an understanding of reasoning as "thought subjected to self-control", and although Peirce admits that there are modes of self-control that escape consciousness or are instinctive, self-control in thinking is also something we are trained to do and "when a man trains himself, thus controlling control, he must have some moral rule in view, however irrational it may be" (CP 5. 533). Eventually, he may undertake to improve this rule, and then he shall need a moral principle that ultimately must be controlled by "reference to an esthetic ideal of what is fine" (*ibid.*). This, however, is where humans diverge from other animals. While animals may think and use signs, they do not control their own thoughts logically, and thus they do not behave as genuine ethical subjects.

It will take a historian to decide how usual or unusual these views were in Peirce's own time, but considering present day discussions on animal cognition and morality, they are striking in several ways. The general taboo in science toward anthropomorphism has, for obvious reasons, been exceptionally rigidly maintained in the study of animal behavior where the observer may so easily commit the error of ascribing a human motivational structure to the studied animal. Only very recently have a few cognitive ethologists, such as Marc Bekoff, dared to claim that many animals do, in fact, exhibit behaviors that we cannot well not call moral (Bekoff and Pierce 2009). Most of us would probably not hesitate long to accept this claim when exposed to pictures such as the one shown recently on Facebook of a snake in the Zoo of Hangzhou (Eastern China) that was fed mice. The photo shows the snake already holding one mouse in its mouth while another mouse is trying to bite the snake in the neck (instead of

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escaping and hiding) in what must be a vain attempt to help its fellow sufferer. The amount of anecdotal evidence such as this is overwhelming but doesn't count much in the minds of skeptics. Decent controlled experiments, on the other hand, are difficult to establish as long as the property in question, morality, cannot be measured objectively, such as by genetic or hormonal analysis, but must be evaluated by analogy to human moral behavior. Nevertheless, as Bekoff points out, when skilled ethologists interpret the narratives informed by their knowledge about a particular species, and their attention to context and individual particularities, it cannot be dismissed as anecdotal evidence (*ibid.*: 37).

Whether apparently altruistic behaviors, such as seen in the mouse example above, really deserve to be called moral behavior is not my concern here. In the end such questions depend on how we define morality. The important point rather is that cognitive ethology in recent years has established strong arguments for the claim that human moral behavior is not a unique property in the world, but a property that has grown out of more primitive forms of social behavior patterns that were already established in several mammal species. The fact that such behaviors antedates the appearance of primates – since they may also occur in more distantly related species such as elephants or mice – confirms Bekoff and Pierce's observation that "morality is an evolutionary adaptation to social living. Many of us tend to think of animals as individual units – the dog underlying my desk, or the squirrel scurrying along the fence toward my bird feeder. But for animals, as for humans, life is really all about social relationships" (*ibid.*: 45). Even though Peirce could not, in his time, have made such a direct claim, the quote from his work dealt with in this article clearly shows his evolutionary intuition. The mental powers of humans are, of course, unequalled among the 'brutes', but animals are not totally deprived of such powers. Peirce admits that they use signs and even that they use language, but they "do not criticize their own thoughts logically", and therefore their activities are not guided by moral rules or ethical principles.

Again, whether the communicative activity exhibited by apes or other animals deserves to be called language use is not the issue here. I personally prefer a more restrictive use of the term language, but rather than raising insurmountable barriers around specific human capabilities, we should be concerned with uncovering the graded mental landscape that separates us from our remote ancestors. The key point here, according to Peirce, is the kind of self-control that humans intuitively or consciously perform in their thinking. Although we may often forget it or even repress it, we also necessarily know that our thinking relies on concepts and ideas and that such concepts and ideas are not identical to the things in the world to which they refer. They are signs, and only humans seem capable of thinking of signs as signs, which is a necessary step in thinking about thinking

and thus controlling our thoughts. As Frederik Stjernfelt has observed: “Self-control involves taking one’s own thought as the object of a meta-level thought. But this is only possible by making the first thought an object – stiffening in the shape of a hypostatic abstraction. Such self-control even makes possible language” (Stjernfelt 2012: 57). Stjernfelt accordingly sees the human ability to perform hypostatic abstractions, such as e.g. the ability to form a concept of “frogness” upon encountering a “frog”, to be a central element in the evolution of the human linguistic mindset (Stjernfelt 2007). Self-controlled thinking consists in the conscious – or to some extent unconscious² – checking out of whether particular signs “are suitably used, focusing on the relation between sign, object and interpretant” (Stjernfelt 2012, 257–8). Self-control thus is not in itself a creative act, instead it presupposes the creation inside the mind of the person of a range of possible inferences and objects to choose between. Human controlled thinking in this sense is itself indebted to our evolutionary past: “the basic pool of such inference structures is found in the perception-action habits refined through the evolution of animals – habits which have been subjected to increasing degrees of control already over the course of evolution, before they are made, in turn, the object of the vastly increasing human processes of self-control by means of hypostatic abstraction and diagram experimentation” (ibid.: 58).

Peirce saw logic as a “normative science” rooted in aesthetics and ethics: A “person cannot perform the least reasoning without some general ideal of good reasoning, for reasoning involves deliberate approval of one’s reasoning; and approval cannot be deliberate unless it is based upon the comparison of the thing approved with some idea of how such a thing ought to appear. Every reasoner, then, has some general idea of what good reasoning is. This constitutes a theory of logic” (CP 2.186). It follows that to Peirce logic was a much wider concept than it was to his contemporaries and to most philosophers of our own time. The narrow deductive and inductive schemes of logic as this discipline is normally conceived would not reflect the richness and creativity of human thinking, or of all thinking in fact, human or not. In addition to induction and deduction, he included abduction as a necessary resource for good human thinking or logic. Thus to Peirce “Logic, in its general sense, is . . . only another name for semiotic (*{sêmeiōtiké}*), the quasi-necessary, or formal, doctrine of signs” (CP 2.227).

² While consciousness must guide this search, it surely also must involve a number of intermediate unconscious (and thus uncontrollable!) steps of evaluation along the path. Peirce was well aware of “Reason to be more than a thousand times as fallible as Instinct” (CP 2.177).

Animals use signs, and they think³, but they don't know that they think through signs, and they cannot therefore reason, they cannot doubt the truth of what they think. This conception of animal cognitive skills is strikingly modern as is also Peirce's understanding of the abductive element of human thinking, an element that was indirectly hinted at by Michael Polanyi (Polanyi 1958) with his concept of tacit knowledge and more directly by Gregory Bateson (Bateson 1979) but which still has not received the attention it deserves in science and philosophy.

3 In one notorious paragraph Peirce even ascribes thinking to brainless or lifeless structures, saying that “thought is not necessarily connected with a brain. It appears in the work of bees, of crystals, and throughout the physical world” (CP 4.551). But this “pancognitivist” and often-cited paragraph seems somewhat out of line with his general thinking.

Robert Marty¹

66 A Purely Mathematical Way for Peirce's Semiotics

Let it be repeated that all the terms of the division must be strictly relevant to logic, and that consequently all accidents of the experience, however universal, must be excluded.

The result of this rule will necessarily be that the new concept of a “sign” will be defined exclusively by the form of its logical relationships; and the utmost pains must be taken to understand these relations in a purely formal, or, as we may say, in a purely mathematical way. (MS 283 also EPII: 389, 1905).

This quote was written in 1905, approximately 40 years after Peirce proposed his first definition of the sign. Meanwhile, he proposed at least about 76 other definitions², some more specific than others. Thus, one wonders whether he still could speak about a “*new concept of a sign*”. He probably considered that he was not able to convince his peers of the correctness of his views. The cause seems to be the *a priori* character of his approach and the logical foundations of his works on semiotics, to the point that he could write in 1902: “*Logic will here be defined as formal semiotic*”³ specifying further on: “*It is from this definition, together with a definition of “formal”, that I deduce mathematically the principles of logic*”.⁴ This begs the question of why Peirce has not been more constant or adamant in his epistemological presuppositions. We find the answer in a draft of a letter to Lady Welby in 1905: “The truth is I went wrong from not having a formal definition all drawn up. This sort of thing is inevitable in the early stages of a strong logical study; for if a formal definition is attempted too soon, it will only shackle thought”.⁵ In effect he needed all this time to eventually set as an absolute rule that formal logic is a fundamental requirement for a rigorous definition of the concept of the sign.

What may (or must) these “forms of its logical relationships” be?

Nowadays, the requirement to base semiotics upon logico-mathematical relations is neatly and specifically expressed through the concept of the semantic model.

¹ University of Perpignan, France.

² See <http://www.cspeirce.com/rsources/76DEFS/76defs.htm>

³ NEM IV: 20–21. Parts of Carnegie Applications.

⁴ Ibid.

⁵ SS: 193, Letter to Lady Welby (Draft) presumably July 1905.

Indeed, complying with that requirement necessarily means putting a correspondence between phenomena (of meaning) which are observed in the social life and a logico-mathematical structure which is obtained by the “abstractive” observation of these particular phenomena. Basically, the perceived thing is different from its mind representation. In such a model one has to combine two sorts of correspondences: on the one hand, a one to one set-of theoretical correspondences between the entities emerging from observed phenomena and the selected logico-mathematical universals; on the other hand a one to one set of correspondence between the relations of these phenomenal entities with each other and the homologous relations between the universals of the model.

Peirce applied these principles with various degrees of clarity in his numerous definitions of the sign.

In a preliminary evaluation, it can be stated that an entity of the real world hereafter named R (the representamen) is a sign if its perception or its coming in the current conscience yields to the mind some awareness of another entity (whatever it is) hereafter named O (the object) so that a determination of the mind is created, hereafter named I (the interpretant), establishing a triadic relation between R, O and I in that mind.

Within this framework, the sign (in other words the representamen R as it is incorporated into this triadic relation) is a medium at the heart of two successive determinations:

As a medium the Sign is essentially in a triadic relation, to its Object which determines it and to its Interpretant which it determines. In its relation to the Object, the sign is passive, that is to say, its correspondence to the Object is brought about by an effect upon the sign, the Object remaining unaffected. On the other hand, in its relation to the Interpretant the sign is active determining the interpretant without being itself thereby affected. (MS 793).

These basic considerations are sufficient to associate the set of observed phenomena with a logico-mathematical structure (more precisely an algebraical structure) which is the first stage of a semantic model of Peircean semiotics. To this end, one defines an algebraic category⁶ with a set of three abstract elements noted O, R and I and six morphisms (abstract relationships between these elements): m_1 between O and R, m_2 between R and I, the composed morphism $m_2 \circ m_1$ between O and I and the 3 identities id_O , id_R and id_I . The diagram below represents this category hereafter called **C**:

$$O \xrightarrow{m_1} R \xrightarrow{m_2} I \quad [C]$$

⁶ [http://en.wikipedia.org/wiki/Category_\(mathematics\)](http://en.wikipedia.org/wiki/Category_(mathematics))

Thus one encompasses the three constituents of the sign along with their relations, establishing the foundations of a semantic model. Thus the phenomena of meaning occurring in the mind are put in “functorial” correspondence with an accurately defined mathematical being. This model is in accordance with a very general idea notably expressed by Leo Apostel: “Any subject using a system A which is neither directly nor indirectly in interaction with a system B to obtain information on B, use A as a model of B”⁷.

Another algebraic category: the category of the coenopythagorean categories

The requirement expressed by Peirce with respect to the definition of the sign cannot be restricted to the concept of sign it must be extended to the entire semiotic construction. For that matter Peirce himself invites us to follow his lead when he defines the phenomenology (or phanerescopy): “So far as I have developed this science of phanerescopy, it is occupied with the formal elements of the phaneron”.⁸ And when he specifies farther: “I invite you to consider, not everything in the phaneron, but only its indecomposable elements, that is, those that are logically indecomposable, or indecomposable to direct inspection”.⁹ How not to see that it is exactly the same epistemological issue? Here is an unequivocal invitation to build another semantic model for the phanerescopy. To this end, Peirce has proposed several ways forward, the most formal being arguably the one based upon an analogy with chemistry, which comes down to a “valental analysis” of the elements of the phaneron: “If, then, there be any formal division of elements of the phaneron, there must be a division according to valency; and we may expect medads, monads, dyads, triads, tetrads, etc”¹⁰. In addition, the mode of combination of these elements allows him to argue that “It can be proved – and really with extreme simplicity, though the statement of the general proof is confusing – that no element can have a higher valency than three”.¹¹ Here Peirce evokes what is now termed the theorem of triadic reduction. This theorem has since been demonstrated through several approaches (Herzberger 1981; Marty 1990; Burch 1991). Within the scope of this

7 <http://www.ehess.fr/revue-msh/pdf/N172R962.pdf>

8 CP 1.284.

9 Ibid.

10 CP 1.292.

11 Ibid.

paper we will not go beyond the following conclusion which offers all the means needed to build an adequate model:

A thorough study of the logic of relatives confirms the conclusions which I had reached before going far in that study. It shows that logical terms are either monads, dyads, or polyads, and that these last do not introduce any radically different elements from those that are found in triads. I therefore divide all objects into monads, dyads, and triads; and the first step in the present inquiry is to ascertain what are the conceptions of the pure monad, free from all dyadic and triadic admixtures; of the dyad (which involves that of the monad) free from all triadic contamination, and what it is that is peculiar which the dyad adds to the monad; and of the triad (which involves those of the monad and dyad) and what it is that is characteristic of the triad. (CP 1.293).

It follows that:

We find then a priori that there are three categories of undecomposable elements to be expected in the phaneron: those which are simply positive totals, those which involve dependence but not combination, those which involve combination. (ibid.).

Thus, noting 1, 2, 3 these categories of phenomena elements (named Firstness, Secondness and Thirdness respectively) one defines a new algebraic category that encompasses 3 elements and 6 morphisms. The category noted **Ph** is displayed in the following diagram.

$$3 \xrightarrow{i_1} 2 \xrightarrow{i_2} 1 \quad [\text{Ph}]$$

In this diagram, arrows i_1 and i_2 must be understood as “logically presupposes”: conceiving the notion of Thirdness requires the notion of Secondness which in turn requires the idea of Firstness.

A semantic model for the classes of signs

On the one hand there is a category **C** resulting from the abstractive observation of the phenomena of meaning. On the other hand there is a category **Ph** arising from an *a priori* concept where phenomena are described by means of indecomposable elements of three and only three types, combined by relative product¹². Now we can work in the field of pure algebra and see how to deal with these two categories. The simplest and most obvious way consists in connecting them by a natural relation i.e. a relation which preserves their mathematical being.

¹² Marty, Robert 1992.

Clearly the concept of functor¹³ satisfies this requirement. In this very simple case, any functor is a double function. The first function applies all the elements of **C** onto the elements of **Ph**. The second one applies any morphism between elements of **C** onto their corresponding morphism between elements of **Ph**. This formal mapping is of interest only if it takes a meaning with regard to the studied phenomena (this is what “semantic model” means). Obviously each functor captures a possibility for a given element of the complete sign represented by **C** to take on the modalities of the being which are represented by **Ph** with the certainty that all the constraints of determination in **C** and of presupposition in **Ph** are respected. This is exactly what Peirce does when he defines the classes of signs using informal approaches. Since then, numerous researchers strove to tinker with trichotomies without much success. Comparatively, our model straightforwardly defines exactly 10 functors of **C** into **Ph**. These functors correspond one to one to the 10 well described classes of signs¹⁴. It is plain to see that each functor applies **globally** the category **C** of the “form of the signs” into the category **Ph** of the “form of the phenomena”. It is possible to go even further. First of all, by considering that these 10 functors are the elements of a new algebraic category whose morphisms are the natural transformations of functors¹⁵. One discovers then that it is possible to naturally embed the affinities between classes of signs, as underlined by Peirce in CP 2.264. Besides, it turns out that these natural transformations can also be considered as relations of order on the classes of signs, thus conferring on this set of functors a lattice¹⁶ structure whose formal properties can also be related to phenomenology. Furthermore we can spread the process to the extensions of the sign to 6 or 10 trichotomies and we find 28 functors in the first case, 66 in the second and two more lattices.

Moreover, the model reveals itself very heuristic. Indeed, mathematical notions from the categories theory and the lattices theory can be interpreted within the realm of the science of the mind. It is not possible to itemize all of them. For instance the notion of “diagram¹⁷ in a category” captures the composition of the meanings; the side notions of sum and product of diagrams account for the construction of the significant totalities, and their particular qualities *sui generis* or “suchnesses”, respectively. This is a kind of a “molecular” model for the combination of elementary, “atomistic” meanings.

13 <http://en.wikipedia.org/wiki/Functor>

14 CP 2.254–2.264.

15 http://en.wikipedia.org/wiki/Natural_transformation

16 [https://en.wikipedia.org/wiki/Lattice_\(order\)](https://en.wikipedia.org/wiki/Lattice_(order)).

17 [http://en.wikipedia.org/wiki/Diagram_\(category_theory\)](http://en.wikipedia.org/wiki/Diagram_(category_theory)).

The adequacy of this model to the requirements expressed by Peirce in the commented quote, as well as its obvious parallelism with all the consequences found by Peirce himself, provide a powerful extension of his logico-mathematical approach. It is even possible to trace back to the level of the percept in order to analyze the passage of the forms from the real world into the mind by combining the formalisms of algebra of relational structures with a connexionist hypothesis borrowed from the neurosciences. Then, a more general model¹⁸ is obtained which includes the model outlined here above. Unfortunately, due to its proper character it exposes itself to the same critics¹⁹ as Peirce suffered, coming from those thinking that “*mathematics, even the simplest, seems has closed book*”.²⁰ The issue is not new and is constantly raised to the community of the researchers.

18 Marty, Robert (1990), “L’algèbre des signes”, op. cit.

19 Triadomany, CP 1.568.

20 CP 1.570.

Torjus Midtgarden¹

67 Pragmatism, Cultural Lags and Moral Self-Reflection

Modern science, with its microscopes and telescopes, with its chemistry and electricity, and with its entirely new appliances of life, has put us into quite another world; almost as much so as if it had transported our race to another planet. Some of the old beliefs have no application except in extended senses, and in such extended senses they are sometimes dubitable and subject to just criticism. It is above all the normative sciences, esthetics, ethics, and logic, that men are in dire need of having severely criticized, in their relation to the new world created by science. Unfortunately, this need is as unconscious as it is great. . . .

[I]t never occurs to anybody that the study of esthetic, ethics and logic can be seriously important, because these sciences are conceived by all, but their deepest students, in the old way . . . The needed new criticism must know whereon it stands; namely, on the beliefs that remain indubitable . . . (CP 5.513, 1905).

In the text from which the quote is taken, as well as in the article published in *The Monist* with the title “Issues of Pragmatism” (1905), Peirce rearticulates his pragmatism in terms of what he now calls “Critical Common-sensism”. In these texts, both of them written in 1905, he re-emphasizes his naturalistic account of belief and doubt from “The Fixation of Belief” (1877) by reminding the reader that belief is not unsettled by Cartesian “paper doubt” but rather by surprise and “with novel environment” (CP 5.512). Further, like in his early work, he stresses that since beliefs consist in “ways of action” (CP 5.510), their settlement comes through “taking a habit” (CP 5.440). In the first part of the quote the naturalistic account is used to articulate a sense of crisis emerging from the rapidly changing material and social environments due to modern technology. The Common-sense philosophical qualification of pragmatism sharpens this sense of crisis since even so-called “indubitable” common sense beliefs, varying “but a little under varying circumstances and in distant ages” (CP 5.498), are seen to be deeply affected by the technologically induced changes. In the second part of the quotation Peirce takes a further step in suggesting an intellectual solution to the crisis through a systematic criticism of common sense beliefs that is enabled by esthetics, ethics and logic, all of which, on Peirce’s classification of the sciences, are to be qualified as normative sciences. Yet, this move is puzzling, given that Peirce (1898) few years earlier had emphatically claimed that these normative sciences, being philosophical and theoretical, not practical,

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sciences, should not be relied on with regard to “vitaly important topics” because of the “utterly unsettled and uncertain condition of philosophy at present” (CP 1.620). Whereas he now takes these normative sciences to be “seriously important”, a few years earlier he had strongly recommended that “[m]atters of vital importance must be left to sentiment” (CP 1.638). To shed light on this aspect of Peirce’s intellectual development I proceed in two steps: firstly, I qualify the sense of crisis voiced through Peirce’s 1905 text by using the so-called “cultural lag hypothesis” developed in early 20th century American social science; secondly, I will clarify how Peirce’s conception of normative science may serve to critically assess the moral authority of “indubitable” beliefs and thus help to develop collective moral self-reflection.

The Sense of Crisis Articulated

Peirce’s dramatic description of how modern science has “put us into quite another world” (CP 5.513) most directly refers to the transformation of the American society in the second half of the 19th century through the implementation and use of new technologies, in particular transportation and communication technologies, such as railway, telephone, and telegraph. Peirce’s description by no means stands alone. Early American sociology took due note of such changes from its very beginning in the last decade of the 19th century.² Yet, it was works such as *The Great Society* (1914), written by the British social psychologist Graham Wallace, and *Social Change* (1922), the classic of the American sociologist William F. Ogburn, that most markedly shaped the sociological conceptualization of the consequences of modern technology. Nevertheless, the quotation from Peirce interestingly anticipates Ogburn’s influential *cultural lag hypothesis*; the hypothesis that technology and material culture are the driving forces of social change and develop more rapidly than non-material, moral and political, culture, and that the latter is slow in adapting to changes in material conditions of life emerging through new technologies.³ Further, in emphasizing how widespread and long-standing beliefs have lost their immediate applicability in new environments Peirce’s reflection points forward to the uptake of Ogburn’s thesis in John Dewey’s and Walter Lippmann’s work.⁴ Not unlike Peirce, both Dewey and Lippmann stressed that cultural lags are not only a sociological, but a *moral*, problem. In a later elaboration Dewey qualifies cultural lags as divisions,

² See in particular Small and Vincent 1894: 143–54, 215–29.

³ Ogburn 1922: 200–13.

⁴ See MW15: 259; Lippmann 1927: 78–90.

not between agents and their environments, but *within* agents: “[s]plits, divisions, between attitudes emotionally and congenially attuned to the past and habits that are forced into existence because of the necessity of dealing with present conditions” (LW13: 97). Dewey goes on to analyze a particular kind of moral inconsistency or “insincerity” that arises when “there has been a period of rapid change in environment accompanied by change in what men do in response and by a change in overt habits, but without corresponding readjustment of the basic emotional and moral attitudes formed in the period prior to change of environment. . . . Not merely individuals here and there but large numbers of people habitually respond to conditions about them by means of actions having no connection with their familiar verbal responses” (LW13, 97–8).

There is a sense in which pragmatism is particularly apt to capture such “insincerities” since from its very beginning in Peirce’s “The Fixation of Belief” habits of action associated with a belief are taken to be more basic than statements or professions of a belief. Peirce’s formulation of the pragmatic maxim in “How to Make Our Ideas Clear” (1878) thus distinguishes between beliefs in terms of “the different modes of action to which they give rise”, not their “different modes of expression” (CP 5.398). On Peirce’s original example, the doctrinarian disagreement between the Catholic view of transubstantiation and the Protestant view of the sacrament is merely verbal, not substantial, since the ways in which believers of both confessions are prepared to respond to the perceived qualities of the wine of the sacrament are basically the same (CP 5.401). This pragmatist account of belief still remains noticeable in the later comment in “Issues in Pragmaticism” that “it is the belief that men *betray* and not that which they *parade* which is to be studied” (CP 5.444n). Nevertheless, in our quotation from Peirce above the sense of crisis evoked by unsettled common sense beliefs comes not only from their wide distribution, and the fact that they have a long history, but from their peculiar moral significance in agents’ self-understanding, and from the sense that their experiential roots cannot simply be discarded, despite overt habitual adaptations to the technological achievements of science. As Dewey later commented, the conflict is “within ourselves and our institutions” (LW13: 98). Yet, in considering that common sense beliefs may have application “in extended senses” (CP 5.513), Peirce suggests that they could be subjected to a pragmatist analysis of meaning. If so, what particular beliefs should be taken into consideration; how does the pragmatist analysis bear on the moral crisis; and how can appeal to the normative sciences of logic, ethics and esthetics support a pragmatist analysis?

Normative Science and Moral Self-Reflection

In his two 1905 papers Peirce underlines that an application of the pragmatic maxim is to enable development of “degrees of self-control” (CP 5.511). More specifically, the pragmatist analysis considers possible circumstances of action where articulations of a belief may be applied, and a purpose agents may have in acting on the belief, and then, finally, what self-controlled ways of action (habits) would ensue from such circumstances and purpose. This, however, requires that the content of the belief is re-articulated in a specific form, by a (set of) conditional proposition(s), such as to facilitate analysis into possible circumstances and purpose, and habits that would follow (CP 5.528). Yet, with regard to “indubitable beliefs” a pragmatist analysis is far from straight forward. Common sense beliefs are, as Peirce admits, notoriously difficult to rearticulate and analyze due to their vagueness, and if their sense is stretched to cover circumstances of action established through modern technology, they will, Peirce anticipates, turn out to be “dubitable and subject to just criticism” (CP 5.513). Further, the examples that Peirce provides of “indubitable beliefs” in his 1905 papers do not seem particularly relevant for the moral crisis at issue: belief in the order of nature (CP 5.508) and belief in the immorality (or criminality) of incest (CP 5.445). Yet, in order to understand how the pragmatist analysis, as well as Peirce’s normative sciences, may come into play, we observe that, given the nature and scope of cultural lags, the analysis is not only to assist an individual agent’s assessment of her beliefs, but to bear on a reflective assessment of our collective cultural heritage more generally. The latter point can be appreciated if we revert to his notes in 1898 on “vitally important topics” and the earlier paper “Logic and Spiritualism” (1890).

In the former notes, where he repudiates direct applicability of philosophy and theoretical sciences to issues of conduct, Peirce takes resort to common sense. Moral and political common sense, he contends, is embodied in our institutions and thus “the dicta of common sense are objective facts, not the way some dyspeptic may feel, but what the healthy, natural, normal democracy thinks” (CP 1.654). Common sense is a collective historic achievement or “the resultant of the traditional experience of mankind” (CP 1.654). As he explains in his 1890 paper, the historical genesis of common sense may, in turn, be taken as a kind of slow, self-corrective process where generations have “taken measure of ordinary experiences . . . transmitted its impression to the next . . . this next has made its observations and discussions, has modified in some insensible degree the sentiment it derived from its fathers” (CP 6.571). We see “social, political, religious common sense modifying itself insensibly in the course of generations, ideas of rights of man acquiring new meanings, thaumaturgic elements

of Christianity sinking, spiritual rising in religious consciousness” (CP 6.574). Notably, Peirce attributes the same kind of non-specialized experiential basis to major theoretical achievements in the history of natural science, although the self-corrective process here assumes the form of conscious reasoning: “The history of the science of dynamics is that of gradual correction by inference from familiar experience (essentially an operation of good sense), of the primitive conceptions of ‘force’ and ‘matter’” (CP 6.574).⁵ Indirectly, this historical testimony provides both moral and rational support for common sense in relation to the “dazzling inventions” that have sprung from science, such as “gunpowder, mariner’s compass, steam-engine, electric telegraph, india-rubber, anæsthetics, sewing-machine, telephone, electric light” (CP 6.564), also, Peirce thinks, since such inventions are rather insignificant from a theoretical, scientific point of view (CP 6.566–7).⁶ The very question of what “relative values” or “worth” could be attributed to “familiar experiences” and to “dazzling inventions” (CP 6.564), and the observation that “Young America” rather values the latter (CP 6.564), anticipate the description of the moral crisis later given in his 1905 paper. Yet, Peirce first develops his philosophical rehabilitation of “familiar experience”.

In the mid-1890s Peirce outlines philosophy as a theoretical science reflecting on, and systematically exploring, familiar, everyday experience as a basis for all specialized sciences (MS 787: 5; CP 3.428), and in particular such pre-scientific use of signs which enables specialization in any theoretical science, and which also serves as a requisite “first grade of clearness” for the pragmatist analysis of meaning (CP 3.457–8). Nevertheless, although philosophy thus becomes reflectively oriented toward “familiar experience”, the classification of the sciences assumed both here and in Peirce’s notes from 1898 makes the division between *theoretical* and *practical* science more fundamental than that between *non-specialized* and *specialized* science. Accordingly, his later pragmatism is not yet assigned an active role in reflecting on “familiar experience” underlying moral common sense beliefs in particular.

When such active role is in fact suggested through reference to the normative sciences, esthetics, ethics and logic, “in their relation to the new world created by science” (CP 5.513), this may be due to a more acute awareness of the moral crisis at stake, and the realization on Peirce’s part that the slow self-corrective process of common sense, if once a defining trait of American cultural history, has now definitely broken down. Whereas Peirce a few years earlier thought that moral and political common sense is “what the healthy, natural,

⁵ See also CP 1.630; CP 1.632; CP 5.610.

⁶ Peirce’s assessment here accords with that of Lewis Mumford in his later classic *Technics and Civilization* (1934: 215–9).

normal democracy thinks” (CP 1.654), his view now seems more adequately covered by Dewey’s later description of a deep conflict “within ourselves and our institutions”.⁷ How, then, can Peirce’s normative sciences be taken to support an exploration of familiar moral or political experience, as well as a critical assessment of the content and authority of common sense beliefs? I can here only sketch a possibility suggested in Peirce’s text.

Since the pragmatist analysis rearticulates beliefs in terms of circumstances of action, purposes and self-controlled habits, but since, however, common sense beliefs may easily conflict with circumstances established through modern science and technology, say, industrial arrangements enabling women to contribute to society in ways undreamed of in traditional ideas of women’s social and political worth,⁸ the pragmatist analysis would start by articulating general purposes, values or ends that may be considered to cohere with basic traits of moral or political culture, although such purposes or ends may not be tied to some particular established belief. Here Peirce’s “duly transfigured esthetics” may come into play: Peirce suggests that “an esthetic ideal” and an “esthetic evaluation” would be “a *virtual* factor of a duly rationalized purport” (CP 5.535), and he stresses that it is the esthetician’s “business . . . to say what is the state of things which is most admirable in itself regardless of any ulterior reason” (CP 1.611).⁹ Although “in ordinary cases” (CP 5.535) such esthetic valuation would play no important role, in times of rapid social change and moral crises it may be called upon for creatively articulating ends or values that would be sufficiently inclusive to have appeal across various groups and segments of society.¹⁰ Since through the 19th and early 20th century the urbanization and mass immigration emerging from implementation and use of new production and transportation technologies occasioned extensive interaction between different ethnic and racial groups in the US, an esthetic articulation of racial equality as

⁷ In one of his letter to Lady Welby (1908) Peirce expresses a rather dystopian conservative vision of American politics: “As to us Americans, who had, at first, so much political sense, we always showed a disposition to support such aristocracy as we had; and we have constantly experienced, and felt but too keenly, the ruinous effect of universal suffrage and weakly exercised government. Here are labor-organizations, into whose hands we are delivering the government, clamoring today for the “right” to persecute and kill people as they please” (Peirce 1958, 402).

⁸ See how Dewey later points out that the industrial revolution provided necessary technological and economics conditions for the women’s right movement (LC: 109).

⁹ See also CP 1.577; CP 1.612; CP 5.594.

¹⁰ See Dewey’s later emphasis on creativity in moral reflection: “When social change is great, and a great variety of conflicting aims are suggested, reflection cannot be limited to the selection of one end out of a number which are suggested by conditions. Thinking has to operate creatively to form new ends” (LW7: 185).

“most admirable in itself” could serve as an example. Such esthetic articulation would be logically prior to how theoretical ethics would formulate norms against racial discrimination and to how practical ethics would enforce changes in our practical reasoning and attitudes to the effect of preventing us from committing acts of discrimination. To aid a more full-fledged pragmatist analysis, however, the esthetic articulation of values or ends, as well as the ethical statement of norms, must be sufficiently specified such as to bear on particular circumstances and conditions of action established through new technologies, and thus become workable in the sense of Dewey’s “ends-in-view” (LW1: 86–8).

Ludwig Nagl¹

68 Peirce on Hegel, Pragmaticism, and “the triadic Class of Philosophical Doctrines”

The truth is that pragmaticism is closely allied to Hegelian absolute idealism, from which, however, it is sundered by its vigorous denial that the third category (which Hegel degrades to a mere stage of thinking) suffices to make the world, or is even so much as self-sufficient.

Had Hegel, instead of regarding the first two stages with his smile of contempt, held on to them as independent and distinct elements of the triune Reality, pragmaticists might have looked up to him as the great vindicator of their truth. . . . For pragmaticism belongs essentially to the triadic class of philosophical doctrines, and is much more essentially so than Hegelianism is. (CP 5436; EPII: 345, 1905).

This is a passage from Peirce’s *Monist* Article “What Pragmatism is”, published 1905 (EPII, 345). It indicates that the depth-structure of Peirce’s (post-pragmatic) “pragmaticism” cannot be explored without a careful assessment of its relations to Hegel. As Kenneth R. Westphal points out, this is no easy task, since these rich relations are not only ambivalent, but also “fraught by historical preoccupations with, and often deficient interpretations of, Hegel’s views”. (Westphal 2006: 177).

Pragmaticism, not “pragmatism”

Mature Peirce critically distinguishes “pragmaticism” from the emergent (and increasingly popular) “pragmatist” discourse by arguing that an in-depth analysis of pragmatism leads to (usually non-assessed) background assumptions (“phenomenology”; “general semeiotic”: “*grammatica speculativa*”, “*rhetorica speculativa*” (CP 1.444)), some of which have a Hegelian ring. While defending the fecundity of pragmatism’s core principle, the “pragmatic maxim” (EPII: 338), mature Peirce rejects pragmatism in all narrow, exclusively action-focused forms. To make “Doing the Be-all and the End-all of human life”, he writes (EPII: 341), “would be the death” of pragmatism: “For to say that we live for the mere sake of action, as action, regardless of the thought it carries out, would be to say that there is no such thing as rational purport” (ibid.).

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The word “pragmatism” (which was coined, and introduced into philosophical discourse, by young Peirce himself) – Peirce writes in 1905 – gets “abused in the merciless way that words have to expect when they fall into literary clutches”. Thus he “feels that is time to kiss his child goodbye ... and to announce the birth of the word ‘pragmaticism’, which is ugly enough to be safe from kidnappers” (EPII: 334–335).

Peirce’s “pragmaticism” entails a broad (re-)conceptualization of *logic*, which he “explicitly identifies with semiotic, the general theory of signs” (Fisch 1986a, 272). Pragmaticism, thus, has a multi-layered – experimental as well as a *categorically-dimensioned* – structure. Though any knowledge of the real includes subjective perceptual judgments (“Firstness”) and the object-focused relation of *hypothesis-testing* (“Secondness”, “outward clash”), it cannot, according to Peirce, be fully explored by means of these two categories. “Every thought is a sign” (W2: 207): *Cognitio* is thus, in its depth, tied to “Thirdness”, “thought” (or *Vermittlung*, as Peirce – sometimes – says with Hegel). Signs result in (and are the interim result of) “interpretants” – actions or (subsequent) signs that are open for re-interpretation in the communicative process of “semiosis”.

Pragmaticism, as Peirce emphasizes, is, in its core, a fruit of the “life in the laboratory” (EPII: 332): it is thus – due to its empirically informed rejection of abstract “ontological metaphysics” (EPII: 338) – a kind of “prope-positivism” (EPII: 339); its “experimentalism”, however, is nowhere *in toto* directed against “a purified philosophy” (EPII: 339): “[I]nstead of merely jeering at metaphysics, like other prope-positivists ... the pragmaticist extracts from it a precious essence, which will serve to give life and light to cosmology and physics” (*ibid.*).

Four (transformed) Hegelian motifs in Peirce: the categories, the triadic structure of signs, semiosis, synechism

In 1905, Peirce wrote that “the one contribution *he had made* to philosophy was the ‘New list of categories’ he had published in 1867 (CP 8.213); and that the one contribution *he had still to make* was a proof of pragmatism, since that ‘would essentially involve the establishment of the truth of synechism’ (CP 5.415)” (Fisch 1986a: 263).

Peirce won (and later re-conceived) his “new list” through critical re-readings of Kant, Aristotle, and Hegel. As a result of this multi-faceted process, he produced his “short list” – shorter than Kant’s twelve categories and much shorter

than the many categories operative in Hegel’s *Phenomenology* or the “categorical divisions” organizing Hegel’s *Encyclopedia*.

In 1903, Peirce summed up the result of his studies as follows (EN2: 148): “In Hegel his long list which gives the divisions of his *Encyclopedia* are his Particular Categories”. This Hegelian “long list” Peirce rejects as “utterly wrong” (EPII: 143). “The case is quite different”, however, Peirce continues, “with the three Universal Categories, which Hegel . . . does not look upon as Categories at all, or at least he does not call them so, but as three stages of thinking.² In regard to these, it appears to me that Hegel is so nearly right that my own doctrine might very well be taken for a variety of Hegelianism” (EPII: 143–144).

As the Peirce quote which this article focuses on (CP 5.436) shows, mature Peirce explicitly characterizes his short list of categories – Firstness, Secondness and Thirdness – a) by means of a critical distinction from, and b) by a positive reference to Hegel’s systematic philosophy. In contemporary discourse, the *negative* part of this assessment – Peirce’s, as Max Fisch said, often “overemphatic criticisms of Hegel” (Fisch 1986a: 274f.) – is predominantly in view. But at closer investigation the semiotic core of Peirce’s pragmaticism – “the triadic [object-sign-interpretant] structure of sign-interpretation, sign-action or semiosis” – reveals its significant (though transformed) Hegelian quality (ibid.: 274).

This *non-marginal double-bind* (Peirce’s criticism of, and his indebtedness to, Hegel) was, until today, never *thoroughly* investigated. Even worse: during the last decades of pragmatism studies the desirability of such an analysis – the idea that an investigation of this double-bind is central for an in-depth understanding of pragmaticism – got increasingly out of sight.³ In 1999, Tom Rockmore pointed out, that “[a]lthough it is known that Peirce appreciated his German predecessor Hegel, they are rarely mentioned together. A source of reticence from the pragmatist side”, Rockmore continues, “is certainly James’s well-known hostility to Hegel, whom he did not know well and appreciated even less” (Rockmore 1999: 179).

That this Hegel-phobia continues to influence (at least segments of) pragmatism studies is quite problematic, however, since in Peirce’s own view Hegel is not only a predecessor of his sign theory, but also grappled with another leading issue in Peirce’s mature philosophy, “synechism” (the other two thinkers who,

² As the editors of EPII point out, the most obvious reading of these “three stages” is “thesis, antithesis, and synthesis” (EN2: 517).

³ “Many of the most important and revealing things about ‘Hegel and Peirce’”, Fisch wrote in 1986, “remain to be said” (Fisch 1986a: 276). Until today the *extensive* study of this topic is a *desideratum*, however.

besides Hegel, tried to explicate this topic are – according to Peirce – Leibniz and the mathematician Boole (Fisch 1986b: 267)).

In his 1892 article “Immortality in the Light of Synechism” (EPII: 2) Peirce characterizes “synechism”, the core idea of his pragmatism (CP 5.415), as “the tendency to regard everything as continuous” (EPII: 1). This “continuity” he elucidates – in a mode reminiscent of Hegel’s triadic *Bewegung des Begriffs* (*Phenomenology*, Preface) – by strictly separating it from the binary, Parmenidean chasm between being and non-being: “There is a famous saying of Parmenides ... ‘being is, and non-being is nothing’. This sounds plausible; yet synechism flatly denies it” (EPII: 2). Like Hegel in his *Begriffsdialektik*, Peirce, in his concept of “synechism”, tries to re-situate, and thus to supersede, the dichotomic abstractness of dyadic oppositions, without *in toto* devalidating their (interim) role. Of course, the “separating” activities characteristic of “understanding” – *der trennende Verstand*, to speak with Hegel – cannot be skipped: “Synechism”, Peirce writes, “can never abide dualism ...”. But synechism supersedes its dyadic logic “which performs its analyses with an axe, leaving, as the ultimate elements, unrelated elements of being” (*ibid.*).

Many other Hegelian ideas can be found, *transformed and re-situated*, in Peirce’s pragmatist semiotics. To name but a few:

- 1) Peirce rejects – like Hegel, who (in his famous remark that “no one can learn swimming without entering water”)⁴ made fun of the attempt to ground epistemology “before starting to actually raise knowledge claims” – all *non-embedded* (or in Peirce’s analysis, “Cartesian”) doubt as a mere abstraction;
- 2) Like Hegel, Peirce tries to abandon Kant’s *Grenzbegriff* of a “thing in itself” as a mere phantasmagorical by-product of the nominalistic (mis)reading of “thought” (i.e. as a “caput mortuum” of reflection, as Hegel says in *Encyclopedia*, §44);
- 3) Peirce’s pragmatist metaphysics *terminates in* (as Hegel’s *Early Theological Writings start from*) the “synthesis” – or “synchechism”-related idea of “love”⁵ (“evolutionary love” i.e., in mature Peirce [EPI: 352–371]);
- 4) Like Hegel, Peirce claims that our truth-focused practical and theoretical attempts at “experience-making” (i.e. pragmatism as “objective idealism” *in actu*) aim at definite “ultimate opinions”. Thus, “absolute idealism” (in

⁴ G.W.F. Hegel, *The Encyclopedia Logic: Part I of the Encyclopedia of the Philosophical Sciences* (trans. T.F. Geraets, W.A. Suchting, and H.S. Harris), Indianapolis: Hackett Publishing Co., 1991, Introduction, Par. 10.

⁵ G.W.F. Hegel. 1975. *Early Theological Writings* (trans. T.M.Knox), Fragment on Love: 302–308. University of Pennsylvania Press: Philadelphia.

Hegel’s terms: “absolute spirit”, *Encyclopedia*, Par. 553–577) is the *telos* not only for Hegel’s systematic philosophy, but also for Peirce’s communicative “experimentalism”: a non-finite, speculative *telos* which, as the last paragraph of Hegel’s *Encyclopedia* indicates, was already envisioned by Aristotle in *Metaphysics* XII, 7.

Hegel’s basic error (according to Peirce)

Though, according to Peirce, pragmaticist semiotics “is closely allied to Hegelian absolute idealism”, it is, nevertheless, “vigorously sundered” from Hegel’s own system, since Hegel – in Peirce’s eyes – tends to *absolutize* “Thirdness”, while, at the same time, “nominalistically” misconceiving it as “a mere stage of thinking”⁶ (EPII: 345; see also Peirce 1903 *The Seven Systems of Metaphysics* EPII: 179–195).

Gary Shapiro, in his re-assessment of this interpretation of Hegel, sums up Peirce’s criticism and starts to question it as follows: Peirce praises Hegel (at times), but more frequently “complains of Hegel’s neglect of quality, immediacy and chance (Firstness), or of shock, compulsion and duality (Secondness). In a diagrammatic discussion of the types of philosophy in terms of Peirce’s categories, Hegel is said to recognize only Thirdness (law, generality, and thought), and he is accused of challenging the ‘independent and irrefutable standings in thought’ of the other categories by maintaining that ‘Firstness and Secondness must somehow be *aufgehoben*’ (CP 5.77n: CP 5.9a)”. (Shapiro 1981: 270) Shapiro is not convinced that this criticism is fair, and contends that “Peirce’s general charge that Hegel ignores or neglects Firstness and Secondness is an exaggeration which needs to be corrected” (ibid.). Peirce, it seems, reads Hegel’s idea of *Aufhebung* in a rather abstract manner: as if, in Hegel, *Aufhebung* would be identical with a *negation* that invites a “smile of contempt” for the negated (EPII: 345). But it is Hegel’s core idea that *Aufhebung* implies *not one but three* meanings: not only *negatio*, but also *conservatio* and *elevatio*. If this is taken into account, neither “immediacy” (Firstness), nor “the outward clash” (i.e. the surprise-generating difference between hypothesis and object) can be said to disappear *in toto* in Hegel’s “mediation”. “Firsts” and “Seconds” are (in spite of being articulated via signs, “Thirds”) *conserved* in their *status as being pre-*

⁶ This in spite of Hegel’s emphasis, in *Encyclopedia*, Par. 9, that there is a substantial difference between the common-sense usage of “concept” as mere *nomen* and his “speculative” (i.e. “objective”) usage of “Begriff”: i.e. “[dass] von dem Begriffe im spekulativen Sinne das, was gewöhnlich Begriff genannt wird, zu unterscheiden [ist]”.

supposed (i.e. as *real* feelings, and as *real* objects), even as they are – by means of this (Thirdness-related) articulation – *elevated* “to a higher”, i.e. *interpreted* level. Peirce’s attack on Hegel’s reading of Thirdness, Gary Shapiro remarks, is “surprising” also from another reason “for it is surely one of the crucial themes of [Peirce’s] epistemology to deny that there can be any immediate or intuitive knowledge and to insist that cognition necessarily involves signs or Thirds”. (Shapiro: 271) But even if the similarities between Thirdness in Peirce and synthesis in Hegel are greater than Peirce is willing to acknowledge, there remain *significant differences* between semiotics and dialectics.

Josiah Royce interprets the ambivalent relation Peirce-Hegel

That Secondness as well as Firstness retain a meaning which cannot be *deduced from*, or *reduced to* Thirdness (while a full concept of Thirdness would re-semiotize, i.e. “interpret”, their content) – this core claim of Peirce’s *unfinished* semiotic system is elucidated and defended (in its difference from all “*monadic*” readings of Hegel which abstractly *absolutize* Thirdness) by mature Peirce’s main discussion partner, the Harvard philosopher Josiah Royce, in his Peirce-inspired theory of “interpretation” (see Nagl 2004).

“Peirce”, as Max Fisch rightly pointed out, “was best understood . . . not by other pragmatists at home or abroad, but by Royce [who] developed Peirce’s *doctrine of signs* at length, applied it to metaphysics, and stated its relation to Hegel in the most important paragraph so far written on ‘Hegel and Peirce’”. (Fisch 1986a, 275). The pragmatist thesis that all sign-related *semiosis* is a process of learning and “growth”, so Royce in *The Problem of Christianity*, has a rather familiar ring:

The rhythm of the Hegelian dialectic wherein thesis, antithesis, and higher synthesis play their familiar parts, will here come to the mind of some who follow my words: and you may ask wherein Peirce’s processes of comparison and interpretation differ from those dialectical movements through division into synthesis, which Hegel long since used as the basis of his philosophy. (Royce 2001: 304).

However, in spite of its closeness to (some) Hegelian motifs, Peirce’s pragmatism, Royce insists, has very significant *post- and non-Hegelian characteristics and qualities*. While it is true that “there is no essential inconsistency between the logical and psychological motives which lie at the basis of Peirce’s triad of interpretation, and the Hegelian interest in the play of thesis, antithesis, and

higher synthesis, . . . Peirce’s theory, with its explicitly empirical origin and its very exact logical working out” throws “new light upon matters which Hegel left profoundly problematic” (ibid.). Unlike Peirce, Hegel was not (and at his time could not be) familiar with full-blown modern experimentalism and post-classic mathematical logic. Thus, although Hegel has, “as few others have done, described the paradoxes, the problems and the glories of spiritual life“, so Royce, his philosophy remains deficient, since he cannot satisfy his readers when treating “outer nature, of science, of mathematics, or any coldly theoretical topic” (Royce 1983, 226–227).

On the relevance of Peirce’s “Hegelian bearings” (Fisch 1986a: 279) for contemporary philosophical discourse

If one seeks to assess the role that a careful re-investigation of Peirce’s post-Hegelian (triadically structured and category-dependent) semiotics could play for modern philosophical debate, three fields of discourse come to mind. *Firstly*: In contemporary (post)analytic as well as (neo) pragmatic philosophies the depth-structure of pragmatism remains, as a rule, underexplored. Thus, a reconstruction of Peirce’s *arguments for a (critical) metaphysics* might significantly deepen the debate, and contribute to a re-orientation of *two discourses*: a) it might help to re-dimension the (often sweepingly “literary”) quality of many *post-Rortyan* pragmatisms (a project recently begun by Robert Brandom); and, b), the informed comparison between Peirce and Hegel could help to re-orient an increasingly sterile Hegel *philology* (that – by bracketing questions of truth – tends to terminate in historical descriptivism) by confronting it with Peirce’s pragmatic-semiotic reading of the modern “world of the laboratory” (see Nagl 2007).

Secondly: The newly emerging interest in Royce’s mature, “peirceanized” thought (see Parker/Skowronsky 2012) invites a careful re-exploration of Peirce’s “Hegelian bearings” since it would help to elucidate the (“absolute-pragmatist”) framework of Royce’s core concept, “community” (Nagl 2004; 2010; 2012a).

And *thirdly*: Peirce’s and Royce’s pragmatist philosophies of religion (which seek to “mediate” science and faith) deserve close attention in an age where a “scientific” closure of the (still open) questions of theology tends to become the “default position” (see Taylor 2007 and Nagl 2012b).

Jaime Nubiola¹ & Sara Barrena²

69 Science as a Communicative Mode of Life

I do not call the solitary studies of a single man a science. It is only when a group of men, more or less in intercommunication, are aiding and stimulating one another by their understanding of a particular group of studies as outsiders cannot understand them, that I call their life a science". (MS 1334: 12–13, 1905).

This beautiful quotation from Charles S. Peirce comes from his "Lecture I to the Adirondack Summer School 1905" and was catalogued as MS 1334 (Robin 1967). In 1986 Kenneth L. Ketner chose fifteen pages (7–22) of the *Notebook I* of these lectures to represent Peirce's conception of science in the volume *Classical American Philosophy* (Stuhr 1987: 46–48). "The Nature of Science" was the appropriate title assigned to that selection, which up to then had been almost unknown to the majority of Peirce scholars. Sara Barrena translated the piece into Spanish in 1996 (Barrena 1996: 1435–1440) and we chose the quotation above as the motto for our then incipient group of Peirce scholars in the Spanish-speaking world because it so finely expressed the aim of our undertaking. Against the traditional image of the philosopher as a solitary thinker near the stove, we wanted, following Peirce, to encourage cooperation and communication between our researchers not only as something useful, but as something *essential* for the real development of science.

The circumstances of these Adirondack Summer School Lectures have been studied with attention by Edison Torres (2015). In 1905 Charles S. Peirce and his wife Juliette were in a desperate economic situation (Brent 1998: 324). Peirce learned that William James had been invited to Glenmore School in the Adirondack region and he tried to get also an invitation for himself as well. The idea was to deliver four lectures in a week, as Peirce explains in the opening paragraph of the *Notebook*. Regrettably, the whole project failed since the school promoted by Thomas Davidson in 1890 could only afford to pay the lodging

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expenses, but could not provide honoraries for the trip.³ Two notebooks of this planned course have survived covering a total of 60 pages.⁴

Although Peirce was a philosopher and a logician, he was first and foremost a real practitioner of science. Not only was he trained as a chemist at Harvard, but for thirty years (1861–91) he worked regularly and strenuously for the U.S. Coast Survey as a metrologist and as an observer in astronomy and geodesy. His reports to the Coast Survey are an outstanding testimony to his personal experience in the hard work of measuring and obtaining empirical evidence. A glance at his official reports to the Coast Survey or at the *Photometric Researches* he produced in the years 1872–75 immediately confirms the impression of a man involved in solid scientific work (W3: 382–493). As Max Fisch points out, “Peirce was not merely a philosopher or a logician who had read up on science. He was a full-fledged professional scientist, who carried into all his work the concerns of the philosopher and logician” (W3: xxviii–xxix; see also Lenzen 1969).

Having done research in astronomy, mathematics, logic and philosophy and in the history of all these sciences, Peirce tried all his life to disclose the logic of scientific inquiry. Peirce insisted that the popular image of science as something finished and complete is totally opposed to what science really is, at least in its original practical intent. What constitutes science “is not so much correct conclusions, as it is a correct method. But the method of science is itself a scientific result. It did not spring out of the brain of a beginner: it was a historic attainment and a scientific achievement” (CP 6.428). Science is for Peirce “a living historic entity” (CP 1.44), “a living and growing body of truth” (CP 6.428), and above all – as our quote stresses – a *communicative mode of live*.

The quote is taken from the heart of the first lecture, when Peirce is dealing with the issue of the classification of the sciences. Although Peirce supported Auguste Comte’s view of each science as a historical development, he disliked Comte’s metaphor of sciences forming “a sort of ladder descending into the well of truth, each one leading on to another, those which are more concrete and special drawing their principles from those which are more abstract and general” (CP 2.119). Peirce preferred a *natural* classification of the sciences, that is, one which embodies “the chief facts of relationships between the sciences so far as they present themselves to scientific and observational study” (MS 1334).

³ There is a surviving letter from Stephen F. Weston, who ruled the school after Davidson’s death in 1900, to C. S. Peirce about this course, from July 27, 1905 (L 465). Since William was spending the summer in the area, the trip was not a problem for him. As William James writes to Peirce “the cash would doubtfully cover your journey. Shed no tears for that!” (Letter August 1, 1905; Perry 1936: 436).

⁴ The images of the pages of *Notebook I* are available at <<http://www.unav.es/gep/Adirondack1-30.pdf>> and <<http://www.unav.es/gep/Adirondack31-48.pdf>>

And Peirce continues asking himself and his projected audience, “What is a science as a natural object?” His answer is essential for us: “It is the actual living occupation of an actual group of living men”.⁵

To Peirce science is not ‘systematic knowledge’, but “the life devoted to the pursuit of truth according to the best known methods on the part of a group of men who understand one another’s ideas and works as no outsider can. It is not what they have already found out which makes their business a science; it is that they are pursuing a branch of truth according, I will not say, to the best methods, but according to the best methods that are known at the time” (MS 1334: 12). These words, which are located in the text just before our selected quotation, emphasize that for Peirce science is above all “*a mode of life*”. As he writes in another manuscript from 1902: “Science is to mean for us a mode of life whose single animating purpose is to find out the real truth, which pursues this purpose by a well-considered method, founded on thorough acquaintance with such scientific results already ascertained by others as may be available, and which seeks cooperation in the hope that the truth may be found, if not by any of the actual inquirers, yet ultimately by those who come after them and who shall make use of their results” (MS 1343: 6–7; also in CP 7.55).

Three essential elements may be highlighted in this account of science as a mode of life: 1) Science is the methodical pursue of a branch of truth in the hope that truth may be found; 2) Science is communicative and cooperative work on a particular area; and 3) The fruit of working together is the establishment of an affective community between researchers. Let us look at these elements in more detail.

In the first place, science is always for Peirce a process of searching for the truth: “The essence of truth lies in its resistance to being ignored” (CP 2.139). In contrast to postmodern skepticism and relativism, Peirce’s defense of fallibilism does not imply that there is no hope for acquiring sound knowledge, or that it is not possible to reach the truth. Although in the short term the methods of science may produce errors, in the long run they are successful: science is a self-corrective research activity. To Peirce a question “has one answer decidedly right, whatever people might think about it” (CP 2.135), and even error has a positive effect in the journey towards the truth: “The idea of science is to pile the ground before the foot of the outworks of truth with the carcasses of this generation, and perhaps of others to come after it, until some future generation, by treading on them, can storm the citadel” (CP 6.3; Haack 1996: 647). Peirce’s fallibilism does not close the doors to truth, but on the contrary makes it possible to progress towards it. “If I am asked”, Peirce writes in another place, “to

5 Of course, today Peirce would have written “men and women”, instead of “men”.

what the wonderful success of modern science is due, I shall suggest that to gain the secret of that, it is necessary to consider science as living, and therefore not as knowledge already acquired but as the concrete life of the men who are working to find out the truth. Given a body of men devoting the sum of their energies to refuting their present errors, doing away with their present ignorance, and that not so much for themselves as for future generations, and all other requisites for the ascertainment of truth are insured by that one" (CP 750, n.d.).

In this sense, it should be said that, in the second place – as our quote stresses – scientists are always part of a community extended through space and time to which they contribute with their work: "I do not call the solitary studies of a single man a science. It is only when a group of men, more or less in intercommunication, are aiding and stimulating one another by their understanding of a particular group of studies as outsiders cannot understand them, that I call their life a science" (MS 1334: 12–13). Each community of scientists grows up around specific ways of perceiving, certain special methods of research. Each science corresponds to a special kind of observation which distinguishes the mode of thought of the students of each special branch (CP 1.100). Scientists are "men who spend their lives in finding out similar kinds of truth about similar things understand what one another are about better than outsiders do. They are all familiar with words which others do not know the exact meaning of, they appreciate each other's difficulties and consult one another about them. They love the same sort of things. They consort together and consider one another as brethren. They are said to pursue the same *branch* of science" (NEM 804–5).

Peirce's personal experience as a scientist working for years in an international context in astronomy and geodesy is essential to his defense of science as a communicative and cooperative process: "Geodesy is the one science the successful prosecution of which absolutely depends upon international solidarity" (W4: 81). The key to the advancement of knowledge and to the development of the sciences is communication. Communication between the members of a scientific community is essential for scrutinizing the evidence and the results achieved in research. There is no algorithm – no routine or unailing method – for discovering the truth or knowing for sure when you have it. Thus, truth and knowledge – at least in the hard sciences – are located at the level of the scientific community rather than the individual inquirer (Ransdell 1998: 10).

In the third place, Peirce clearly asserts that the scientific community, far from being an assembly or a parliament whose members fight each other with fierce arguments, should be more like a family. "A given science with a special name, a special journal, a special society, studying one group of facts, whose students understand one another in a general way and naturally associate

together, forms what I call a family” (CP 1.238). A scientific community is always – or at least should be, according to Peirce – an affective community of brothers. This image of a scientific community implies a peculiar mixture of interaction and differences, kept united by *agape* (Hausman 1998). Real communication is always a task of love: Truth is the goal of scientific inquiry and love is a distinctive feature of truth. In the words of Peirce: “The Law of Reason is the Law of Love”.⁶

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⁶ “Review of *Clark University, 1889–1899. Decennial Celebration*”, *Science* 11 (1900), 620; reprinted in P. P. Wiener, ed. (1966). *Charles S. Peirce: Selected Writings. (Values in a Universe of Chance)*, New York: Dover. 332.

Augusto Ponzio¹

70 Not an Individual, but a dual Self (at least)

Two things here are all-important to assure oneself of and to remember. The first is that a person is not absolutely an individual. His thoughts are what he is “saying to himself”, that is, is saying to that other self that is just coming into life in the flow of time. When one reasons, it is that critical self that one is trying to persuade; and all thought whatsoever is a sign, and is mostly of the nature of language. The second thing to remember is that the man’s circle of society (however widely or narrowly this phrase may be understood), is a sort of loosely compacted person, in some respects of higher rank than the person of an individual organism. (CP 5.421, 1905).

This quote is from the article “What pragmatism is”, published in *The Monist* (vol. 15: 161–181), 1905, the first of three all published in the same journal dedicated to pragmatism (1905–1906). To evidence just how recent general use of the term “pragmatism” was, Peirce (in a note to CP 5.414) claims that he had never used the term before in print, apart from in his entry “Pragmatic and Pragmatism,” in *Baldwin’s Dictionary* (1901–1902, vol. 11: 321–322; reproduced in CP 5.1–4).

However, he also adds that he had been using the term “pragmatism” continuously in philosophical conversations since the mid 1870s; and, in fact, pragmatism had always characterized Peirce’s thinking style. Important to remember are his 1903 “Lectures on Pragmatism”, particularly the seventh, “Pragmatism and Abduction”.

All the same, in “What pragmatism is” Peirce announces his intention to abandon the term “pragmatism”, now “abused in [a] merciless way”, and to implement, instead, the term “pragmaticism” (CP 5.414). Giovanni Vailati reviewed this essay for the journal *Leonardo* (July-August, 1905). With Mario Calderoni he shared an understanding of the difference between Peirce’s pragmatism and William James’s version. This created the opportunity for Peirce to write an interesting letter (he never sent) to Calderoni on pragmaticism (CP 8.205–213). In 1905–07 Peirce worked on a letter-article for the Director of *The Nation*. There remain three drafts of which the last (1906–07) is published in CP under the title “A Survey of Pragmatism” (CP 5.464–494).

Pragmatism though orienting our discourse is not our immediate topic here. Instead, our focus is on the statement signalled from “What pragmatism is” (CP 5.421), where Peirce evidences: 1) the improper use of “individual” as a definition of a man, a person; and 2) that “the man’s circle of society”, however it is

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understood, is in turn “a sort of loosely compacted person, in some respects of higher rank than the person of an individual organism” (CP 5.421). We will comment and develop this paragraph contextualizing according to Peirce’s conception of semiotic as it emerges in its most prominent and topical aspects.

1. The question of the *self* is inevitably connected to the question of the *other*, not only the other from self, but the other of self. We could begin by commenting the passage by Peirce and evidencing the self’s doubleness. The self is double insofar as it is a sign. And not as a sign for another self that renders the first sign an object of interpretation, as in the case of “you” or “he”. Doubleness concerns the self as a sign for self, in the position of self. The position of self presupposes a doubling in *interpreted* and *interpretant*. Each time there is an “I feel”, “I think”, “I want”, there is a self interpreted by an interpretant self. Therefore the I is not someone else’s self, but one’s own self rendered an interpreted by the same self in the position of interpretant (Petrilli 2012).

In general, the Interpreted is something, an Object, antecedent to interpretation, autonomous and independent from interpretation. In this sense the *Interpreted* is “material”, it is rendered an interpreted by an *Interpretant*, therefore a sign, thanks to an *Interpreter* (Petrilli & Ponzio 2005; 2008). In the case of the sign I, of the sign I-position, the *Interpreter* is the I that, from its own point of view, gives an *Interpretant* of itself, of the self *Object* which is autonomous and material. Consequently the I, or better, I/self acts as an *Interpreted* and at once as an *Interpreter / Interpretant*. The I, we could say, “splits itself in two” presenting itself as an I and a self, an I/self: *I Subject / Self Object, I/self Interpretant, I/self Interpreted, I/self Interpreter*: in the experience-utterance “I’m cold”, my Me (Self Object), through the interpretant “I’m cold”, is made an interpreted by my I interpreter.

The I/self doubles. In effect, its becoming an *Interpreter* depends on its presenting itself as an *Interpretant* sign of the self (*Object*) which is thus rendered an *Interpreted* sign. The interpretant makes the interpreter I an interpreted. What, instead, preexists to it is its Self Object: antecedence, autonomy, objectivity, materiality of this self. The self gives itself in interpretation, as an interpreted object and at the same time as a “dynamical object” (in Peirce’s terminology) of interpretation. Ultimately, we have a double I: the *I as an interpretant sign* and the *I (Object, Self) as an interpreted*.

Interpreted and interpretant are the sign I in its different determinations: “I’m afraid”, “I’m innocent”. All these determinations refer to the self for an I, an interpreted-interpretant. The self forms the substratum, substance, *subjectum* of the interpretations of the I. Self is the I’s alterity. All the I’s through which this self becomes an interpreted, the “I am”, “I do”, “I make”, etc. refer to the self, but do not contain it.

The doubling of the self in interpretant-interpreted and its irreducible alterity correspond to the sign triad according to Peirce's formula: Sign or *Representamen*, *Interpretant*, *Object*.

The interpretant, similarly to the sign generally, plays a determining role for the sign I/self. The interpretant is a *response*. It is also recognition, identification, but above all a response. As an *interpretant* the I/self is *fundamentally a response*. This can also be expressed by saying that *the I/self, like all signs, is a pragmatic operator*.

We said that the I/self is a sign and as such it is doubled into interpreted-interpretant. This is its *identity* as an I/self. The I/self defers to its self, to its *alterity*. Is this self, this other, which is not another I/self, a sign too?

The answer is that the I, as much as the self are *signs*. The self is a living body and like all that is living, the body is semiosis, a sign process. The I/self is what mediates this semiosis in terms of signs. That which the body experiences directly is refracted in the I/self's interpretation. *The I/self is this refraction*. In both, in the self, the living body, and in the I, there intervene interpretants, which do not consist only of identifications, but of responses. The finality of identifying something is the *response*.

Given that in the former – the self – the response is direct, immediate, un-reflected (but only relatively to the latter, because every interpretation, every response is effectively mediated), while in the latter, the I, it is (more) indirect, mediated, reflected, a substantial difference is that the self is a *semiotic* (pragmatic) operator, while the I is a *semiotic* or *meta-semiotic* (pragmatic) operator, capable of mediated responses. The I as a *semiotic* pragmatic operator is *awareness*, *consciousness*.

Insofar as it is characterized by consciousness, the conscious, the capacity for reflection, insofar as it is *semiotic*, the I's response, unlike the self's semiotic response, presents itself always and inevitably in terms of *responsibility*. In one case as in the other, given that there is a sign, there is meaning, an interpretant. But in the case of the self, meaning only gives itself as *signification*, whereas in the case of the I it also gives itself as *significance* given that it involves mediation, responsibility, planning, standpoint.

The I consists in the interpreted-interpretant relationship and insofar as it is a sign, the interpretant refers, in turn, to another interpretant and so forth in an open chain of deferrals so that there is no firm point, no final interpretant. Identity of the sign calls for a continuous shifting movement, so that each time the sign is interpreted it becomes *other*: it is, in fact, *another sign* which acts as an interpretant. This is also true of the I's identity. This necessary other is functional to the I's identity, to the process of becoming an I, its condition of possibility.

The I is structured in temporal terms and emerges as a paradox of the I-other relationship, of identity and difference. The I is the ideal limit of an open identification process where, through cognitive and practical activity, alterations are superseded in the protension beyond the I's being present and identical.

The subject uses signs, *is a sign*, as Peirce claims. As such, it is continuously shifted, rendered other, in deferral processes from one interpretant to another. Rather than preceding the sign and controlling it, the subject presupposes the sign, belongs to it, emerges as the interpretant of a preceding sign. The I's consciousness is no more than a relation between a "sign-object" and a "sign-subject", a "meta-sign", or more explicitly the relation between a sign and its interpretant. The *dialogical character* of the subject is inevitable.

Just as it refuses the principle of the code's supremacy over the sign-interpretant relation, Peirce's semiotics also refuses the subject's supremacy over this relation. Peirce traces otherness in the subject, itself an open dialogue between sign and interpretant. Thought for Peirce is structured dialogically. The relation between sign and interpretant is never one of mere equality, similarity, reduction of differences, of equivalence without a residue, substitution of the identical with the identical.

When we think (CP 5.284), the thought-sign forming the I is interpreted by a subsequent thought without which the former could not have the value of thought-sign. Each thought-sign is translated and interpreted in a subsequent thought-sign, in an open chain of deferrals among multiple I/self-signs constituting the thought of the "same person". Each cognition or representation consists of interpretive relations among mental states at different moments.

We do not have a subject, on one hand, and interpretive processes, sign-interpretant relations inside the subject when s/he thinks, on the other. The subject does not contain interpretive processes, nor does s/he preexist with respect to them, nor does s/he control them from the outside: s/he is the chain of sign-interpretant relationships in which s/he recognizes her/himself; to the point that experience of the other self is not a more complex problem than recognizing certain sign-interpretant relations as "my own", those through which the "I" becomes conscious of myself: "The recognition by one person of another's personality takes place by means to some extent identical with the means by which he is conscious of his own personality" (CP 6.160).

The implications that can be drawn from our initial Peirce quote are topical for semiotics and concern not so much the "semiotics of communication", where communication is understood as the exchange of messages, but rather "semiotics of interpretation", which refers not only to cognition in its pragmatic aspect, but also the process through which the self is constituted. This view finds confirmation and possibility of a more thorough understanding in the second part of the quote in question.

2. The second point Peirce insists on in our quote is that the “circle of society” – “however widely or narrowly this phrase may be understood” – is not an individual, a collective individual, a totality, not even an aggregate of individuals, a sort of Leviathan composed of human individuals, as in the famed frontispiece of the book by Hobbes thus entitled; it “is a sort of loosely compacted person”, a higher rank than an individual organism. The circle of society is made of interpersonal relations, subject to given classifications and organizations through language understood as a modelling procedure and on the basis of a given historical-natural language. This part of our quote from Peirce calls for explanation and development considering the role he assigns to language, to the word *à propos* the existence of thought itself, of man understood as “zoon politikon”, the role of verbal language in the constitution of social relations. It is evident that verbal language not only makes interpersonal communication possible, but most significantly it is the condition for identification, differentiation and determination of the different modalities of social relations which depend on the verbal that denotes them.

Different modalities of intersubjectivity subsist as intentional objects in the practical or theoretical attitudes that concern it. These modalities are thematized, interpreted, identified, chosen, desired, avoided, etc. The language of a given community makes given signs available to the subject which enable that subject to accomplish such operations and represent them. Language as modelling introduces intervals in the social universe, in the social *continuum*. Thanks to such intervals this *continuum* is articulated in a series of distinctive units, in intersubjective relationships, rendered significant in relations of mutual opposition and correlation, in differential gaps that pass between them. In such articulation of the social which finds verbal expression in a given language (*langue/lingua*), a subject can be identified on the basis of its relation to others.

This occurs, for example, with a fundamental category of discourse, the term “person”: each one of us presenting ourselves as an *I* with respect to a *you* or *s/he* is mediated by linguistic categories. Through use of a common system of personal references, identical for all members of a linguistic community – I, we, you (s.), you (pl.), she, he, they – a given subject can be recognized in its identity and difference from others, the attention oriented towards “one’s own body”, and given lived experiences attributed to it.

The meanings of verbal terms that refer to social relations, or to the members forming them and interpreting them, represent differentiated models and ideal types of behaviour for the subject, expected, possible and proscribed behaviours, relatively to the community it belongs to. This is not a mere question of nomenclature. In interpersonal relationships the pragmatic aspect also comes into play. Complementary and indispensable to all *appellative systems* that classify and

determine human subjects and their relationships there intervenes another system, the “*system of attitudes*” (Lévi-Strauss). *Descriptive-prescriptive* meanings are fixed *à propos* interpersonal relations in all linguistic systems; and interpretations, classifications and prescriptions concerning social life are sedimented in language. This is a question of ideal relations forming on the basis of language understood as modeling procedure and interhuman communication. Handed down through the verbal signs that signify them, these ideal relations enable constitution of current relations, concrete and individual, as significant relations, distinguishable from each other, identifiable and intersubjectively comprehensible.

Our concrete positioning in the relation thus acquires a sense for ourselves and for others, becomes communication, a message. Interpersonal relations can be considered from a semiotic perspective, or as messages, constructed on the basis of sign systems. They appear communicative only on the basis of the fact that we refer to them. We speak to each other, we mutually exchange messages not only by uttering and writing words, but also by expressing through our behaviour, our mutual orientations, fixed meanings in verbal signs that concern our intersubjective with-being.

Social organizations, the constitution of systems of relations, are developed through verbal-linguistic activity, such that every historical-natural language is a system of relations, classifications and interpretations of intersubjective relations. On this basis, concrete relations acquire a sense and can be programmed, established, distinguished, evaluated.

Language (*langue/lingua*) with its model relations, its *kinaesthetic types*, delimits the field of possibilities concerning distinction, interpretation, choice and expression of intersubjective attitudes, and offers schemes for common behaviour, for us to follow, and for our positioning towards others. Using terminology from information theory, intersubjective communication, through the mutual attitudes we assume towards each other, occurs on the basis of dialectics between *information* and *redundance*. Intersubjective attitudes, as original and new as they may be, to be informative must be based on foundations of normality, of obviousness. There exist intersubjective behaviours in which redundance suffocates all information, in which there is no uniqueness, originality, novelty with respect to roles. The excess of redundance in individual behaviour determines its predictability, standardization, ritualization, alienation.

If consciousness is a social product, so are my relations with others. Each one of us relates to others as we relate to “one’s own relations” insofar as we each belong to a given “circle of society”. Just as it isn’t possible to use a private language, to invent a new, personal linguistic code if one does not already possess a public language through which the world gives itself as already classified, articulated, in its different aspects, objects, events, in the same way it is not

possible to invent new, original modalities of intersubjective relationships, if not insofar as they already belong to a network of interpersonal relations. A new meaning a given subject intends to establish for relations with others can only be evidenced by that subject in light of the social and historical context s/he belongs to and which the language of the community s/he belongs to renders comprehensible. This seems to be the sense of Peirce's words when he urges us to remember that the "man's circle of society (however widely or narrowly this phrase may be understood), is a sort of loosely compacted person, in some respects of higher rank than the person of an individual organism".

Andrew S. Reynolds¹

71 Science and Metaphysics

Find a scientific man who proposes to get along without any metaphysics . . . and you have found one whose doctrines are thoroughly vitiated by the crude and uncriticized metaphysics with which they are packed. (CP 1.129, 1905).

Recent pronouncements by several notable physicists (see below), give this passage, written ca. 1905, an ironically prescient relevance. It originally appeared in a Notebook with the title, “Sketch of Some Proposed Chapters on the Sect of Philosophy Called Pragmatism”. Earlier in the same document Peirce wrote that “The special sciences are obliged to take for granted a number of most important propositions, because their ways of working afford no means of bringing these propositions to the test. In short, they always rest upon metaphysics” (CP 1.129). Consequently, he pronounced, “there is no escape from the need of a critical examination of ‘first principles’” (CP 1.129).

Peirce appears to be saying that science cannot hope to escape entirely from making certain ‘metaphysical’ assumptions. As discussed here a metaphysical proposition or ‘first principle’ would appear to be marked by two features: (i) it is of a nature not investigable by means of the methods and techniques of the specific science in question, and (ii) it is important to, perhaps essential to, the normal and successful conduct of research in that special scientific discipline. From (i) it would seem to follow that the set of metaphysical propositions could be discipline-specific, i.e. a proposition could be ‘metaphysical’ in one scientific field but not in another, should the latter provide the means with which to investigate the proposition. The descriptor ‘metaphysical’ may be a relative one, then, not absolute. This would make sense given Peirce’s belief that all the various sciences could be classified in a hierarchical system according to the degree of generality of their special principles – the less general reliant upon the more general. Philosophy – including metaphysics as the study of the most general features of reality and real objects (CP 6.6) – lies near the bottom of this system (only less fundamental than mathematics, the science of necessary reasoning). Therefore the philosopher alone, guided by logic, is equipped to examine the special science’s “axioms” (CP 1.129).

What kinds of ‘metaphysical’ propositions from the special sciences did Peirce have in mind? He noted the assumption by physicists such as Kelvin and Maxwell that there is no physical action at a distance and that the laws of

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mechanics hold good for atoms. Both these assumptions were shaken within just two or three decades by the development of quantum physics. Elsewhere (CP 1.109; CP 1.111; EPII: 222–223) Peirce mentions Claude Bernard's statement that disease is not an entity but merely a sum of symptoms, as resulting from 'bad metaphysics'. (It is worth noting that all these instances of exploded assumptions were in fact exposed by researchers within the very same special science, not by philosophers operating with more general or fundamental methods or principles).

Peirce's use of the term 'first principles' brings to mind axioms or postulates, like Euclid's famous parallel postulate: that parallel lines never intersect, which Riemann and Lobachevski showed to be false in curved 'non-Euclidean' spaces. But he was likely alluding to the philosopher Herbert Spencer's thesis of 'First Principles.' Spencer argued that science (and religion) relies upon certain fundamental concepts which are beyond investigation and therefore unknowable. Spencer (1862) argued that concepts like space, time, force, matter, and cause were wholly incomprehensible, while at the same time essential for our scientific knowledge and understanding of phenomena. Peirce was critical of attempts to pronounce any question beyond investigation, for to do so is to violate his 'first rule of inquiry': do not set up road blocks in the path of inquiry. Spencer's philosophy was an example of what Peirce called 'Seminary philosophy', a mode of inquiry he contrasted with his own 'laboratory philosophy.' Recalling his earlier essay on "The fixation of belief", we can say that 'seminary philosophers' employ the *a priori* method, the method of tenacity or authority, in short any method but the scientific method. This was the method of the 'laboratory philosophy' that Peirce endorsed according to which no question is decided on subjective or *a priori* grounds that might be decided experimentally.

At the time Peirce wrote this passage (ca. 1905) he was concerned to rescue his brain-child pragmatism from its trendy and not so scientific advocates; a concern that saw him introduce the uglier term "Pragmaticism". Pragmatism he insisted was originally meant to be a method for clarifying ideas so that they might be put to experimental test against reality. "The most striking feature of the new theory [pragmatism] was its recognition of an inseparable connection between rational cognition and rational purpose" (EPII: 333). In the earlier essay "How to make our ideas clear" he applied it critically to the German physicist Gustav Kirchoff's statement that although scientists know how to reason and calculate with the concept of force, and so know its effects, they do not know what force itself is (CP 5.404). This is simply confusion Peirce insisted, for if one understands all the effects of thinking about force there is simply no other cognitively intelligible content to capture. He further illustrated how the pragmatic maxim would cut through metaphysical confusion by consideration of

the Catholic thesis of transubstantiation, the proposition that a substance can exhibit all the sensible properties of wine and yet be blood. Pragmatism, he wrote in 1905, would show ontological metaphysics to be meaningless gibberish, one word being defined in terms of another, i.e. without any empirical and experimental significance, or else absurd (EPII: 338–339; CP 5.423).

Although he sounds contemptuous of what he called ‘ontological metaphysics’, Peirce wanted to salvage “the precious kernel of truth in metaphysics”. Metaphysics in general is not useless, one must simply employ the right method and leave as many questions open to experimental or observational test as possible. His own metaphysical system (guided by pragmatism) was to provide a series of pigeon holes in which to house important scientific facts and would not exclude *a priori* anything that might be settled by experiment or observation. It would, he said “give life and light to cosmology and physics” (CP 5.423; EPII: 339), particularly accounting for the laws of nature themselves, the prevalence of irreversible processes in the universe, mind and sensation. It would do so by proposing as a working hypothesis that all things, including the laws of nature, evolve. Spencer’s evolutionary philosophy, by contrast, was only partially evolutionist (CP 6.14) as it relied on the law of the conservation of energy as a brute fact from which Spencer attempted to deduce the entire universe and its features.

Spencer’s philosophy was a form of agnosticism that gave up too easily by proclaiming certain ‘first principles’ to be forever unaccountable, and so violated the first rule of inquiry. But the quote under consideration here alludes to a different sort of vice which might be described as scientism: the attitude that science can get along without metaphysics, and that the special sciences (or one in particular perhaps—physics) can account for everything that needs accounting for.

Recent events bring us two interesting examples of this attitude. Both involve claims by physicists to have solved the problem of ‘why there is something rather than nothing’. The first is the book by Stephen Hawking and Leonard Mlodinow in which they claim to explain, with the help of M-theory (the best candidate for a grand unified theory of physics), that the universe exists because a quantum theory of gravity permits a universe to spontaneously pop into existence as a random fluctuation of the quantum void. But before explaining all this they proclaim that “philosophy is dead” (2010: 5); after which they proceed to explain how their scientific account relies upon the perspective of what they call ‘model-based realism.’ Philosophers will recognize this as a version of the semantic or model theory of theories; (but if two physicists say it, perhaps it doesn’t count as philosophy?). But aside from that, Hawking and Mlodinow do not explain why the physical principles (e.g. quantum field theory) upon which

their explanation of the universe's existence relies exist. They seem to identify the history of science with the establishment of scientific determinism, and insist "These laws should hold everywhere and at all times; otherwise they wouldn't be laws" (Hawking & Mlodinow 2010: 171). The second related example comes from an exchange between the theoretical physicist Lawrence Krauss and the philosopher of physics David Albert. Krauss also recently claimed to have explained (with a similar argument employing relativistic quantum field theory) how the universe came into existence from nothing (Krauss 2012). In his review of the book Albert took issue with this, stating that Krauss actually only provides an argument for how the observable universe might emerge from the nothingness of the quantum vacuum, which is not quite nothing but a particle-less state of the quantum field. Krauss, therefore, has not accounted for the quantum field and the laws that describe it. Krauss, showing great frustration with what he considered to be Albert's philosophical quibbling and hair-splitting² responded that he was not just suggesting that matter emerged from a particle-less state of the quantum vacuum, but that *space* and *time* and *matter* all emerged from a state in which there was none of these things: and that surely is a more significant nothing than just a particle-less region of space-time. But as for the question where did the physical laws come from on which his explanation of the universe rests, Krauss was actually quite upfront that this was a perfectly legitimate question (Krauss 2012: 174) about which he could provide no definite answer, though he did suggest that an infinite regress of more fundamental laws or principles would be better than positing an inexplicable brute (and mysterious) fact like God (Krauss 2012: xii). Indeed a strong motive for both these books, judging from the frequency with which the topic arises, seems to be a desire to show that physicists can explain why the universe exists without any appeal to the God hypothesis. If that is correct, then it appears the authors are not so unwilling after all to engage in philosophy.³

² "I don't really give a damn about what 'nothing' means to philosophers; I care about the 'nothing' of reality; and if the 'nothing' of reality is full of stuff, then I'll go with that". Krauss quoted in Andersen 2012.

³ Now it might be that the claim that there exists a super-natural being who is responsible for creating the universe is an empirical one (though I doubt it), and if so, one might claim that disputes about its plausibility would not count as strictly philosophical. But this would be to restrict our definition of philosophy solely to non-empirical matters, which I think many would agree is far too narrow. Moreover, Hawking and Mlodinow (2010: 5) criticize philosophy precisely for failing to keep up with modern science, and physics in particular. So, which would they have: that philosophy ignore physics as falling outside its proper domain or admit they are themselves engaged in a philosophical discussion?

So what might Peirce have made of all this? For starters, he would no doubt insist that the thesis of ‘scientific determinism’ (or ‘necessitarianism’) is a *meta-physical* assumption that goes beyond the observable and testable evidence (CP 1.132), and rigid adherence to it makes it difficult to explain other important features of the universe. Would he sympathize with Krauss’s opinion that some philosophers spout meaningless gibberish when they complain that Krauss’s concept of ‘nothing’ is not quite nothing enough? I doubt that Peirce would regard Albert as a ‘seminary philosopher’; and in fact Krauss himself seems to recognize the legitimacy of asking what accounts for the fundamental laws of quantum physics – he just thinks that to do so is to ignore how much modern physics is able to accomplish. Krauss also considers the possibility that the fundamental laws arose randomly as just one possible scenario among a range of possibilities within a larger multiverse, in which case no further explanation for their existence need be given (Krauss, 175–176) – but that is to kick away the ladder after using it to climb to the spot from which you declare ladders to be unnecessary. The laws of quantum physics appear to be absolutely essential to the Hawking-Krauss explanation that because ‘nothing is unstable’ a universe of some kind must exist. Peirce’s cosmology, his evolutionary metaphysics, was an explicit attempt not to leave any ‘brute facts’ or fundamental laws or principles unaccounted for. To do this he proposed that the very laws of nature themselves evolve over time into more precise and regular form, having initially started as the vaguest, most imprecise, stochastic correlations in an original state of inchoate and irregular chaos. This was a state of ‘nothing’ in the sense that there was no regularity and no precise ‘things’ yet whatsoever. Peirce’s trick was to say that chance events require no explanation, regularities and laws do, and if there is no regularity, then there’s nothing to be explained. The first germ of regularity (of ‘habit-taking’) he proposed emerged spontaneously and in a fundamentally chancy (tychistic) fashion.

Peirce would no doubt be more sympathetic with the recent writings of the theoretical physicist Lee Smolin, who argues that an adequate cosmological theory ought to satisfy the principle of sufficient reason (explaining why the universe has the particular features it does) and a ‘principle of explanatory closure’, meaning its explanations should not rely on factors lying outside of the universe, which means no positing of brute facts or timeless laws (Smolin 2013, 115). What he calls the standard (Newtonian) paradigm of doing scientific cosmology assumes the existence of timeless laws acting asymmetrically on a timeless space of possible configurations of the universe (ibid. 43–44). In contrast Smolin suggests—like Peirce – that the laws of nature are stochastic regularities that evolve over time. This allows for the production of genuine novelty in the universe, while making time more real and fundamental than matter, space, or

the laws of nature. This does, however, he explains, raise a difficult problem he calls the ‘meta-law dilemma.’ The dilemma is this: Either there is a meta-law which explains how the laws of nature evolve or there is no such meta-law. If there is, how to account for this meta-law? Do we appeal to yet another meta-meta-law?, and so on to an infinite regress? On the other hand, if there is no meta-law to explain how the laws of nature evolve then there would be an unaccountable element of randomness concerning their existence, which violates the principle of sufficient reason (*ibid.* 243).

Smolin offers several partial solutions or ways of at least ‘postponing’ the dilemma. One is his hypothesis of ‘cosmological natural selection,’ according to which new universes emerge from black holes with slightly different laws which vary by chance (like genetic mutations) from those of its parent universe (Smolin 1997; Smolin 2013, 125–129). Another, which he calls the ‘principle of precedence’, is strongly reminiscent of Peirce’s ‘law of habit’ and supposes laws to be stochastic and subject to continual evolution over time (Smolin 2013, 146–153). With regard to quantum systems, he proposes that the behavior of a truly novel system might not be determined prior to the events freely unfolding, making the outcome genuinely unpredictable from all available information. Once a ‘precedent’ for the outcome has been set, however, there ought to emerge an increasing probability of obtaining similar results or measurements as the trials continue. If laws have in fact evolved in accordance with this principle of precedence (or ‘habit-taking’), then setting up such a novel quantum system would make the hypothesis experimentally testable. How the meta-laws dilemma is resolved, he insists (*ibid.*, 245) will determine the direction of cosmology in the 21st-century.

I have discussed the adequacy of Peirce’s attempt to “solve the riddle of the universe” elsewhere (Reynolds 2002); but I do wish to repeat here that I think his is the most ingenious attempt to account for the universe and its laws in an explanatorily complete way that leaves as little as possible unaccounted for. To explain everything – including the components of your own explanans – may be an impossible task, but at least Peirce recognized and illustrated just what is really involved in taking on that task.

So perhaps we never can entirely eradicate metaphysical (i.e. untestable) beliefs or ‘first principles’ from our sciences. But this quote from Peirce reminds us that we should always be willing to identify them and drag them into the open so that they might be critically evaluated. Pretending they aren’t really there or don’t really count, Peirce would likely say, is a form of reasoning as suspect as declaring them to be unknowable or inexplicable.

Lucia Santaella¹

72 The Semiosphere: A Synthesis of the Physio-, Bio-, Eco-, and Technospheres

... all this universe is perfused with signs, if it is not composed exclusively of signs.
(CP 5.448 fn, 1905).

Since the 1970s, even before I began to specialize in Peirce studies, I had been fascinated by the idea of a realm of signs. In those days, the topic was discussed under the name of *noosphere* (Chardin 1956; Auger 1966; Monod 1970; Morin 1973). As I advanced in my readings of Peirce in the 1970s, I began to realize that there was a natural connection between Peirce's concept of semiosis and the noosphere. In 1990, when the *Universe of the Mind* became available in English, my enthusiasm was reinvigorated by Lotman's notion of the *semiosphere*, which the Tartu semiotician had coined in this book. Finally, the missing connection between the notions of noosphere and the idea of a universe permeated with signs had become available. The change from the Greek root *νοῦς* ('thought') and the rather vague notion of a 'sphere of ideas' to the neoclassical root *semios-* ('sign') meant an advance in the project towards a theory of a sphere of embodied signs in line with Peirce's semiotics.

In Lotman's semiotics, the notion of semiosphere began to take shape when the author started calling into question the traditional model of communication in which a message is transmitted from a sender via a channel to a receiver. For Lotman, this account of communication is inadequate insofar as it prevents insight into the essence of what it means "to be immersed in a semiotic space". In analogy to Vernadsky's notion of *biosphere*, Lotman defined the *semiosphere* as "the semiotic space necessary for the existence and functioning of languages" and concluded that "outside the semiosphere there can be neither communication, nor language" (2001: 123–24).

Whereas Lotman restricts the meaning of the term semiosphere to human culture and the *Universe of Mind*, the Danish molecular biologist Jesper Hoffmeyer, in *Signs of Meaning in the Universe*, extends its scope to the domains of organisms in their interaction with their environment:

The semiosphere is a sphere just like the atmosphere, the hydrosphere, and the biosphere. It penetrates to every corner of these other spheres, incorporating all forms of communication: sounds, smells, movements, colors, shapes, electrical fields, thermal radiation, waves of all kinds, chemical signals, touching, and so on. In short, signs of life. (Hoffmeyer 1996: vii).

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The author gives ample and convincing evidence of “how we humans live, like all other animals, plants, protists, fungi, and bacteria, within a semiosphere” (1996: vii–viii). A fundamental premise of his biosemiotic investigation is “that the biosphere must be viewed in the light of the semiosphere rather than the other way around”, and the goal of its research program is to “follow the growth of this semiosphere from its infant beginnings around seven hundred thousand years after the big bang right up to the animals and plants of today” (1996: viii). Furthermore, biosemiotic research, according to Hoffmeyer, has also the aim to “follow the semiosphere into the heart of organisms, to where cells swarm around amid a cacophony of messages” and to “demonstrate how it was possible for these swarming cells finally to turn into thought swarms within human beings who knew how to talk to one another and could differentiate between good and evil” (ibid.).

Hoffmeyer’s thesis that semiosis is at the root of life and that the language of humans is nothing but the extension of semiotic processes that begin at the level of molecular biology has meanwhile found international acknowledgment, but the same can hardly be said of the still more ambitious theory that semiosis begins in the sphere of physical processes. Nevertheless, the claim that there is also a semiotic physiosphere from which the biological semiosphere may have emerged, which takes the above quoted Peircean dictum of the universe perfused with signs at face value, has been defended in studies by Deely (1990; 1998; 1999; 2001; 2012), Nöth (2000; 2001), Hulswit (2002), and Santaella (1994; 1996; 2004; 2007; 2009).

If the hypothesis of the universe perfused with signs in the above Peirce quote proves valid, the conclusion is that sign processes are not restricted to human minds and the agency of other biological organisms but is operative in lifeless physical nature, too. That Peirce was in fact convinced of the validity of this premise can also be concluded from the following affirmation made in his paper *Prolegomena to an Apology of Pragmaticism*:

Thought is not necessarily connected with a brain. It appears in the work of bees, of crystals, and throughout the purely physical world; and one can no more deny that it is really there, than that the colors, the shapes, etc., of objects are really there. Consistently adhere to that unwarrantable denial, and you will be driven to some form of idealistic nominalism akin to Fichte’s. (CP 4.551).

Despite such textual evidence, by no means isolated in Peirce’s writings, the premise that semiosis may be studied in the world of physical processes, too, has been ignored or even rejected by a good number of Peirce scholars. This is probably so because the fields of physical, biological, and anthropological research have traditionally been studied as entirely separate disciplines without

any interdisciplinary links. However, since the mid-20th century, new research, especially from nanotechnology and computational engineering, has challenged the doctrinaire separation between the sciences of life and of lifeless nature. Advances in the basic and applied sciences are calling into question the old distinctions between the natural and the artificial, the physical and the mental, and with it, all traditional parameters of humanism and of the human sciences. In light of such developments, authors such as Featherstone and Burrows are convinced that “the key analytical categories we have long used to structure our world, which derive from the fundamental division between technology and nature, are in danger of dissolving; the categories of the biological, the technological, the natural, the artificial *and* the human – are now beginning to blur” (1996: 6).

The new anthropomorphism emerging from science and technology in conjunction with Charles S. Peirce’s radical synechism, antidualism, and objective idealism have inspired me to abandon all residual dualisms inherited from Cartesian traditions and to adopt the position that any fundamental semiotic separation between the spheres of human culture, other living beings, and even of lifeless physical things is artificial and ultimately untenable. According to this position, the premise of a fundamental semiotic dividing line between the bio-, eco-, anthropo-, and technospheres as well the physiosphere can no longer be accepted, despite all other distinctions that may exist between them.

In spite of its radical and far-reaching implications, this position must neither be misunderstood as the one of a general pansemiotism (for the critique of which see Deely 2006) nor as a shallow holism disseminating flowering metaphors into humid grounds. Instead, a most careful examination of what Peirce means by the triadic logic of semiosis in nature and culture is required. Semiosis is the triadic action of the sign, and its study requires a dynamical and integrated approach. Only a semiotics based on these premises can provide the analytic tools for the extension of the semiosphere from the universe of mind to a cosmic physiosphere, from micro-organisms to culture and technology.

In the metaphysical context of synechism, “the doctrine that all that exists is continuous” (CP 1.172), mind means continuity. It is the tendency of the universe to acquire habits. For Peirce, mind is also a synonym of semiosis. Situated at the interface between metaphysics and semiotics, the concept of semiosis is the proper tool for extending the notion of semiosphere to an all-pervasive sphere of sign action. The study of the semiosphere in this sense will reveal insights into the formal, logical, and evolutionary principles common to the physiosphere, the biosphere, the ecosphere, as well as the anthroposphere (cf. Santaella 2009).

Besides postulating the dynamics of semiosis to the comprehension of the synechistic continuity, I also postulate that there is a similarity between the way semiosis operates and final causality as Peirce defines it. Peirce came to reinterpret the Aristotelian doctrine of causation due to historical interpretative inconsistencies and to the narrow view of causality adopted by his contemporaries, the view that a cause is an event which is necessarily followed by another event, which is its effect (CP 6.66), or that when A occurs, B will occur, which became largely adopted after Hume.

Peirce disagreed with the two most influential theories of causation of his time, the deterministic one, on the one hand, and the teleological Kantian concept as an unconditional and invariant sequence, on the other. “Had Kant studied the psychological phenomena more attentively and generalized them more broadly, he would have seen that in the mind causation is not absolute, but follows such a curve as is traced in my essay towards “The Law of Mind” (CP 6.600). Peirce did not deny that there are real causes but he understood them as final causes. Hence the kind of necessity involved in natural laws (which differ from the empirical generalization which we make on the basis of these laws) needs to be interpreted in light of the concept of “tendency”, in the realm of thirdness, the category of generality, continuity, time, change and evolution, all of which is implied in the dynamics of processes of semiosis. Cases of necessity in natural laws which can be expressed in propositions such as “If A than B” must be interpreted as cases which are placed at the limit of a tendency, cases in which a tendency is almost rigid, hardly open to the interference of chance and very little submitted to change. Pape’s explanation to this question is especially clear:

The laws of classical mechanics are not laws of nature at all. Indeed, Peirce stressed repeatedly that they are merely formulas. Correspondingly, mechanical forces are not causes in a strict sense, because “. . . one may reasonably object to saying that a mechanical force is cause of motion, instead of calling it the time-slope of a motion” (MS 1343, p. 29). In the case of action as it is described by classical mechanics the final state of a system is completely due to an isomorphic transformation of what was given in terms of initial positions of the particles into the final configuration of positions. For every one initial configuration of particles and distribution of forces there is exactly one way the final state is produced by the correlated accelerations of the particles. In the case of mechanical action it makes no sense to speak of a definite end that had to be reached in a number of different ways. (Pape 1993: 589–590).

The same manuscript deals with all the different gradations which extend from the brute mechanical processes to processes of intelligent reasoning. Pape presents a detailed analysis of each of the following grades: (a) mechanical action, (b) a comparison between purposeless action and almost purposeful action, (c) action

governed by mind where the exercise of mind is as stupid as possible, (d) animal intelligence of the lowest degree (MS 1343: 28), (d) intelligence of higher animals, and (e) intelligent action of beings capable to learn from experience (Pape 1993: 589–591). The range of causality may begin with the most rudimentary physical forms and it extends to the most developed forms of finality in intentionality, self-control, and self-critique.

Final causation involves intentionality, which is the psychological self-conscious version of final causality, but final causation is not limited to intentionality. Final causality also includes purposes in general, but Peirce points out that it is “a widespread error to think that a ‘final cause’ is necessarily a purpose” since it is in fact “merely that form of final cause which is most familiar to our experience” (CP 1.211). Elsewhere, Peirce identifies purpose with “final causation, of which it is the conscious modification” (CP 7.366). He also defines purpose as “an operative desire” and adds that “a desire is always general” (CP 1.205; cf. MS 1343). From the latter definition we can derive the following distinction between desire and purpose: whereas desire is predominantly a final cause and a phenomenon of thirdness, purpose, due to its being operative and serving as a means to an end, can be taken as a prototype of a perfect connection between efficient and final causality. Purposes can be unconscious as well, and in the biological world a purpose can be merely an “action virtually directed toward the removal of stimulation” (CP 5.563; cf. CP 1.392 & CP 6.281).

Notice that “a final cause may be conceived to operate without having been the purpose of any mind” (CP 1.204). That is why Peirce proposed that besides the study of how final causality operates in the development of biological species and how it can be applied to biological individuals, there should be a previous study to define the essence of mind and the law of final causality, together with its application to non-biological phenomena.

When Peirce describes final causation as intelligent action, the adjective “intelligent” must not be misunderstood in any anthropocentric sense. “Intelligent action” is nothing but the synonym of *semiosis* or “the action of almost any kind of sign” (CP 5.483). *Semiosis* is the general term covering the notions of “mind” as well as “thought”, but not in a sense restricted to human minds and thoughts. Wherever there is learning, self-correction, habit change, or purposive action aiming at a goal, there is intelligence. There is *semiosis* when “the pollen-grain of a flower . . . penetrates the ovule of the plant from which it came” and thus “transmits the peculiarities of the latter” (W1: 333). There is *semiosis* in the flight of birds, in the interactions of cells in an immune system which detect hostile agents such as viruses, and there is *semiosis* in human thought and communication. This is why the notion of final causality must be studied together

with key terms of cybernetics such as feedback and control or notions from the theory of evolution, such as morphogenesis, teleonomy, autopoiesis, as well as key concepts of the sciences of complexity, such as self-organization (cf. Ransdell 1983).

Peirce described a logical process, the way signs act, which was formally presented in his numerous definitions and classifications of signs. There is nothing strictly anthropological in such a study since the logic of signs is applicable to biological processes (Emmeche 1991; Hoffmeyer and Emmeche 1991) and even to physical processes of any kind as far as they are irreversible processes which exhibit an asymptotic tendency for the finalization of a state of affairs. What is it that moves and guides all of these processes? Aristotle believed with Anaxagoras that the cosmic *nous* causes all motion. Peirce took a different direction. In his paper *The Architecture of Theories*, he explains that

The law of habit exhibits a striking contrast to all physical laws in the character of its commands. . . . No exact conformity is required by the mental law. . . . The law of mind only makes a given feeling more likely to arise. It thus resembles the 'non-conservative' forces of physics, such as viscosity and the like, which are due to statistical uniformities in the chance encounters of trillions of molecules. (CP 6.23).

A year later, Peirce identified two characteristics common to nonconservative forces and minds, *irreversibility* and *finiousness*.

Those non-conservative actions which seem to violate the law of energy, and which physics explains away as due to chance-action among trillions of molecules, are one and all marked by two characters. The first is that they act in one determinate direction and tend asymptotically toward bringing about an ultimate state of things. If teleological is too strong a word to apply to them, we might invent the word *finious*, to express their tendency toward a final state. The other character of non-conservative actions is that they are irreversible. (CP 7.471).

Peirce proceeded with the recognition that efficient cause (force) is not able to explain irreversibility. "Uncertain tendencies, unstable states of equilibrium are conditions *sine qua non* for the manifestation of Mind" (CP 7.381) in triadic actions which, even in its most rudimentary forms, exhibits at least a drop of intelligence. Most probably, all sign action has something anthropomorphic to it in the sense that it always involves causation through general abstraction whose most typical instantiation is in the self-control which the human mind exerts on human conduct. What this involves is nothing but the most typical form of final causation, not the only one, but the most complex form. Thus, Peirce extended terms such as "mind", "intelligence", and "thought" to nonhuman domains with the purpose of demonstrating that there is continuity between

human minds and processes which pursue other kinds of purposes. The latter ones exhibit characteristics of mind in the sense in which action towards an end can be found in micro-organisms, in biological evolution, and even in crystals (CP 6.250). This postulate is in accordance with the theory of dissipative structures of Prigogine and Stengers (1984) where final causation resides in the tendency from chaos to order in certain chemical reactions.

The main difference between final causality in physical nature and human minds is in the degree to which errors, deviations, self-control, and self-correction occur. Exceptions from the regularities predicted by physical laws testify to real but only minute and rare variations in the effects of the laws of nature. They are due to the interference of chance. In the human minds, errors and short term deviations are frequent and numerous, but learning and self-control tend to reduce them in the long run. Irreversibility is hence constitutive of any natural and mental process. Peirce was looking for a definition of irreversibility sufficiently broad to comprise the mental and the physical and found the suitably abstract concept for the characterization of all of these phenomena in the “law of mind”. As I have shown elsewhere (Santaella 1992; 1994; 1996; 1999; 2004; 2009), the concept of final causation embraces, in a single and complex triadic logic, the coextensive ideas of time, thought, intelligence, life, growth, and evolution. Hence, the key to final causality is in all these ideas related to thirdness, whose simplest form can be found in the way signs act and embrace the concepts of continuity, generality, law, mind, the law of mind, and the acquisition of habit as well as habit change.

We have seen that “mind has its universal mode of action, namely, by final causation” (CP 1.269; cf. CP 2.66 & CP 7.559). However, it is not restricted to psychical phenomena (CP 1.269) nor is it restricted to biological ones. Just like in biological organisms, final causality can be found in machines, such as computers and robots which have the capacity to pursue general goals in a variety of ways and which allow self-correction to improve their output (cf. Nöth 2002). In sum, there is final causation or mind wherever there is triadic interaction, that is, wherever there is a tendency towards habit change, learning, growth, evolution, however rudimentary it may be.

Peirce’s concept of mind, which acts by final causation and which expresses itself in the logic of semiosis, is a very broad concept. However, it is precisely this breadth which makes it useful to the study of some issues currently of central interest to physics, biology (Hoffmeyer 2001: 279), and Artificial Intelligence (Steiner 2013). In these domains of research, it enables us to rethink the current technological revolutions which have not only extended our bodily functions as well as our perceptual and sensorial capacities, but also our brain. The basic

logical model of semiosis that finds its expression in the definition of the sign is not only a model of mind, intelligence, continuity, and growth; it is also a model of evolution. Peirce was convinced that evolutionary processes in general are manifestations of mind, understood in the much extended sense in which he defined the word. Such ideas, which sounded out of the ordinary when Peirce first submitted them to his contemporaries, begin to sound more and more plausible in light of the renewal of ideas in the recent contemporary intellectual debate.

James Wible¹

73 Peirce's Persistent Interest in Economics

The sort of science that is founded upon the common experience of all men was recognized by Jeremy Bentham under the name of *cenoscopy*, in opposition to *idioscopy*, which discovers new phenomena . . . But long before Bentham's day the situation was sufficiently understood to set up a movement in the more enlightened countries to supply the psychical sciences with an analogous analytical foundation . . . It moved in Italy, in France, and especially in Scotland. The analytical economics of Smith and Ricardo were examples of it. The whole doctrine in its totality is properly termed the Philosophy of Common Sense, of which analytical mechanics and analytical economics are branches. That Pragmatism of which so much has been said of late years is only an endeavor to give the philosophy of common sense a more exact development. (CP 8.199, 1905).

One of the strands of Peirce's many intellectual interests over several decades was political economy or economics. To be sure it came nowhere close to being his dominant interest. Peirce like others by the 1890s referred to that discipline as economics following the on-going processes of renaming within the discipline at that time. As it developed, the term economics came to connote a discipline more self-consciously scientific and mathematical than political economy.² The preceding quote from Peirce's 1905 review of Wundt's *Physiological Psychology* suggests a systematic reason for his persistent interest in economics. The quote comes in the last decade of his life. While his references to economics may not be nearly as systematic as the quote suggests, nonetheless the quote may suggest why Peirce continued to refer to economic examples over several decades. In the passage quoted above, Peirce aligns both pragmatism and economics with Scottish common sense realism.³ This suggests that Peirce viewed the economic

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² In the history of economics, this period is known as the "Marginalist Revolution". But for a few exceptions, this is the period when economists first used calculus and derivatives to formulate economic theory. Quotes from Peirce's writings reflect this name change. References early in his career are almost always to political economy while those after the 1890s tend to be to economics.

³ On other occasions Peirce had explored the medieval realism of Duns Scotus. In the early 1890s he wrote: "The author of the present treatise is a Scotistic realist. He entirely approved the brief statement of Dr. F. E. Abott [Peirce's Harvard classmate] in his *Scientific Theism* that Realism is implied in modern science. In calling himself a Scotist, the writer does not mean that he is going back to the general views of 600 years back; he merely means that the point of metaphysics upon which Scotus chiefly insisted and which has since passed out of mind, is a very important point" (Peirce 1893b, CP 4, 50). Later in his life, Peirce emphasized that pragmatism had roots in Scottish common sense realism. A comparison of these two views of realism is beyond the scope of this contribution.

and business situations of the common man as domains where the principles of pragmatism could be observed in action.⁴ Something similar could be said for the discipline of economics. In the early 1900s, many economists were just beginning to generalize the logic of economic processes with applied mathematics. Peirce apparently approved of the development of mathematical economics as long as it was understood that he did not adopt the utilitarian framework that most mathematical economists brought to that endeavor. If utilitarianism as economists tended to interpret it is viewed as a psychology of lower mental processes in terms of pleasure and pain; and if the associational theory of abstract ideas as developed by James Mill, John Stuart Mill, and other British empiricists is taken to be a psychology of higher mental processes, then Peirce viewed pragmatism and economics differently. Instead of emphasizing an intellectual lineage from British empiricism, utilitarianism, and associationism, Peirce preferred to place the roots of pragmatism and economics in Scottish common sense realism.

There are instances in Peirce's writings where he offers an economic example as an illustration of his ideas. Often an economic example was meant to contrast with a psychological application that his readers or listeners might have expected. At other times, economic examples were also illustrations of the theory of chance and probability. Also, Peirce was interested in state of the art mathematical economics in the 1870s. Concerning his use of economic examples, part of the difficulty is that Peirce according to his own account had offered a psychological interpretation of pragmatism in the 1870s focusing on inquiry as a matter of settled belief. Then in the 1890s and especially in the Harvard Lectures of 1903, Peirce rejected the psychological interpretation in favor of a logical one consistent with his conceptions of semiotics and logic including the logic of sampling and probability.⁵ By semiotics Peirce (1903) meant that all thought occurs in signs. Signs can be mentally manipulated to form the components of a syllogism and an inference. In part, Peirce (1905b) coined the new term "pragmaticism" to connote a focus on a logic and semiotics of inquiry rather than a psychology of inquiry. The rigor of Peirce's (1902) conception of logic can be seen in his "Minute Logic". Some of the passages are at the frontiers of logic for that period of time and would have been difficult to comprehend except for the world's most advanced logicians at that time. In that work, Peirce did criticize his phil-

⁴ For example in "Fixation of Belief" Peirce (1877, W3: 244–245) writes that "Logicity in regard to practical matters is the most useful quality an animal can possess." Then in a lecture at Johns Hopkins Peirce (1882: 380) holds that "You cannot play billiards by analytical mechanics nor keep shop by political economy."

⁵ Peirce offered such an account of his earlier conception of pragmatism as being too psychological in Peirce (EPII: 140).

osophical rivals for their sloppy intellectual habits and for being “amateurs” in logic.⁶

More needs to be said about the quote from the review of Wundt. First, Bentham's terms *cenoscopy* and *idioscopy* may not be familiar to many. *Cenoscopy* is what Peirce meant by a very broad form of inquiry based on phenomena accessible to anyone who took the time for disciplined inquiry. In contrast, *idioscopy* was inquiry based on the methods and techniques of a specialized science. Without the specific training, experimental investigations, and laboratory procedures of a particular science, one would not be able to make the discoveries of the experimental sciences. In Peirce's words the reason for the distinction between *cenoscopy* and *idioscopy* “is that a very widely different bent of genius is required for the analytical work of philosophy and for the observation work of special science”.⁷ Second, in 1905, while criticizing Wundt and psychology, Peirce would have had the more logical and semiotic conception of pragmatism in mind even when he was using the term “pragmatism”. While recognizing Wundt's fundamental contributions to physiological psychology over the four decades since the 1860s, in the review Peirce takes the position that experimental psychology was being outpaced by other more productive sciences in the early 1900s. In contrast to the optimism about psychology in the 1860s, Peirce claims that “a chilling shade settles on the hearts of enthusiasts”.⁸ Those enthusiasts must now view the developments in psychology as “modest” in comparison to the “unheard-of-leaps that every other science has performed ...” Peirce concludes: “there is not a science that has not left psychology in the rear ... Who will diagnose the malady of psychology?”

While economics is not included on this list, Peirce goes on to discuss what has made so many sciences successful. The more successful physical and natural sciences were created in the context of a “science of dynamics”.⁹ To have analogous organized inquiry for the study of human beings, Peirce takes up the

⁶ For example in the “Minute Logic”, Peirce's creates an imagined conversation with someone who is discussing “some broad, far-reaching question of science or philosophy”. It is not hard to realize that he has another rival “pragmatist” in mind, perhaps someone such as James, Schiller, or Dewey: “He proceeds slap-dash, depicting the logical situation as in a blackboard diagram rather than as in a critically accurate anatomical plate. For the most part, he has but the vaguest notion of how he has come to his principles. He has gathered them casually, after the custom of amateurs. It might seem to behoove every man who has occasion to lay down principles of reasoning in a grave scientific discussion to be more than an amateur in logic” (Peirce 1902, CP 2: 6).

⁷ The quote is from Peirce's his second Harvard Lecture, Peirce (1903: 146).

⁸ This and the following quote are from Peirce (1905: 196).

⁹ Peirce (1905: 197).

thread from Jeremy Bentham who advocated founding human sciences on the “common experience of all men”. This is where the quote at the beginning commences. Bentham’s philosophy of common experience or cenoscopy was taken up in Italy, France, and Scotland. Modern political economy is thought to have begun with the works of Adam Smith and David Ricardo. Peirce continues claiming that this line of thought emphasizing common experience ought to be called the “Philosophy of Common Sense”. Analytical mechanics and analytical economics he considers to be branches of this philosophy of common sense. Then he claims that pragmatism as he understands it, is the attempt to give the philosophy of “common sense a more exact development”. Even though Peirce continues to review Wundt’s views of psychology, the distinct impression is that Peirce regards economics as being more progressive in its development than psychology. The reason is that economics, as Peirce interprets it, is more broadly in line with pragmatism *cum* pragmatism, the philosophy of common sense, and even his semiotics than is psychology.¹⁰ Since economics was not on Peirce’s explicit list of successful sciences, the implication may be that it is heading in a more analytical direction than is psychology but has a long way to go to be as successful as physics and the natural sciences.

A chronological account of his writings on economics or economically related topics would give useful background to Peirce’s interest in economics. Peirce’s interests in economics can be traced back to his days as a student at Harvard College. In a student essay, Peirce (1857) was concerned with the impact the quantity of gold or money had in causing inflation during the California gold rush. Among Peirce’s publications, the most obviously economic one is his (1879) “Note on the Theory of the Economy of Research”. The “Note appears to have been written before the publication of Peirce’s six essays on pragmatism in 1877 and 1878. The “Note” creates a version of Stanley Jevons’s model of utility maximization. Jevons’s (1871) used calculus to create a mathematical expression for balancing the choice of two food commodities such as beef and corn.¹¹ Jevons’s creates derivatives that represent the additional utility per unit of currency spent on beef and corn. The utility optimizing consumer would equate the derivatives for corn and beef respectively. Using similar mathematics, Peirce applied cost-constrained utility maximization to scientific research. He argued that the incremental experimental value of knowledge gained per dollar spent on each research project should be equated across research projects. For ex-

¹⁰ Full development of this point would require more detailed argument than can be presented here. This is a topic of ongoing research by the author.

¹¹ See Wible (1994).

ample, different pendulums could be swung to get the underlying data for his gravity calculations. Money should be spent on another type of pendulum up to the point that the increment in accuracy per dollar spent is the same for each instrument. It is worth noting that Peirce's conception of scientific "utility" would have a much less subjective interpretation than a consumer's utility since the conception of accuracy is one that would be defined by a community of scientific researchers. Also, the noted Peirce scholar Max Fisch has written that the "Note" should be considered as perhaps a seventh essay on pragmatism.¹²

There are additional papers and manuscripts on economics in the 1870s. Besides an interest in Jevons's mathematical economics of the consumer, Peirce was also intrigued by the mathematics of the theory of the firm. In December of 1871, there was a meeting of the Cambridge Scientific Club which met to discuss the mathematical economics of the French economist, A.A. Cournot. In 1838, Cournot had written the first treatise on mathematical economics in French on monopoly, duopoly, competition, exchange rates, and relative prices. Among these topics, duopoly is Cournot's most well-known contribution. Cournot analyzed competition between two producers of mineral spring water using calculus. Using first order conditions for profit maximization, Cournot analyzed how each of two producers in the market would divide the market and react to the other firm. The resulting equations have become known as reaction functions and are still present in advanced mathematical discussions of the theory of the firm. In a letter to his father Benjamin, Peirce (1871c) recreated the famous duopoly model of Cournot and his reaction functions. This was about a decade before one of Cournot's critics by the name of Bertrand (1883) commented on the duopoly model. There were several other letters in the early 1870s which suggest that Peirce and others in the Scientific Club had read and mastered most of Cournot's mathematical economics.¹³ These letters and manuscripts are filled with equations and first order conditions. Also, one of the manuscripts offers what Peirce (W3: 176) calls the "First Axiom of Political Economy" that "if a person prefers A to B and B to C, he also prefers A to C". This idea which Peirce wrote down in 1874, became known as the "Axiom of Transitivity" in consumer theory in the 1950s. Perhaps because of these letters, manuscripts, and "The Note", one can

¹² Fisch's suggestion is found on one of his "data slips" at the Peirce Edition Project. Knowing that the "Note on the Theory of the Economy of Research" was written in the mid 1870s causes one to read the economic references in the essays on pragmatism differently and perhaps more specifically in an economic way. Perhaps this is the reason Fisch thought that the "Note" should be considered as a seventh essay on pragmatism.

¹³ Peirce (1871a to 1871d and 1874).

find several economic themes in the essays on pragmatism.¹⁴ In the “Fixation of Belief”, Peirce’s (1877) argument for the scientific method has an important economic dimension. Other methods of inquiry for settling doubt may require more time, resources, or disagreement. The scientific method gets us to a level of belief which resolves doubt with fewer wasted resources.¹⁵ The first method for settling inquiry was one of tenacity. For an example, Peirce took a popular economic issue like free trade as it was debated in the nation’s leading newspapers. He mentioned that attitudes for or against free trade seem to be held more as a matter of tenacity. Such arguments can be in error and may be difficult to correct.

Although Peirce’s use of economic examples may often portray economics in a favorable way, he was critical of certain perspectives on economics. Perhaps Peirce’s most critical passages about economics can be found in his 1893 essay, “Evolutionary Love”. That essay is the fifth piece in Peirce’s second best known series of published articles, “The Monist Metaphysical Series” of 1891 to 1893. In that series, Peirce presented the main ideas of his evolutionary metaphysical speculation that he had written in the 1880s known as the “Guess at the Riddle”.¹⁶ In “Evolutionary Love”, Peirce maintained that higher motives of art, education, religion, and science that are in the interest of others can be the result of evolutionary processes as well as the lower purposes of self-interest. Purposes can be directed at satisfying one’s needs and desires from a self-centered perspective or from one that is based on higher purposes. Here Peirce criticizes economics for basing its theory of human motivation on pleasure and pain relating to self-interest. In particular, he directly attacks Simon Newcomb’s (1886a) *Principles of Political Economy*. The passage which Peirce criticizes is one where Newcomb harshly criticizes assistance for the poor.¹⁷ In the 1880s, Newcomb was a leader of the conservative, free market view of economics known as the “old school”. In several prominent exchanges in *The Princeton Review and Science*, Newcomb

¹⁴ Without much more detailed discussion, it would be difficult to decide whether the economic writings are further illustrations of pragmatism or whether economics influenced his conception of pragmatism in some fundamental way.

¹⁵ For example in “Fixation of Belief” Peirce illustrates how much time and effort is wasted without with a scientific method. Commenting on the research of a famous astronomer, Peirce (W3: 243) remarks that Kepler “blundering along in the most inconceivable way (to us), from one irrational hypothesis to another, until, after trying twenty-two of these, he fell by mere exhaustion of his invention, upon the orbit which a mind well furnished with weapons of modern logic would have tried from almost at the outset”. Then a few pages later commenting on the need for a guiding principle of inference, Peirce (W3: 245) suggests that without such a guide “the most masculine intellect will oftentimes lose his orientation and waste his efforts in directions which bring him no nearer to his goal, or even carry him entirely astray”.

¹⁶ Peirce (1887–88).

¹⁷ For more on Newcomb and Peirce see Wible (2000).

clashed with a group of younger economists known as the “new school”. They were led by a younger colleague of Newcomb’s at Johns Hopkins, Richard Ely.¹⁸ The new school economists criticized the scientific and moral principles of the “old school” and the use of calculus in economics. It is the new school which founded the American Economic Association in 1886. In “Evolutionary Love”, Peirce seems to express support however obliquely and indirectly with the moral sentiments of the new school of economists in his direct critique of Newcomb’s *Principles*. But it is also clear that Peirce favored a more mathematical approach to economics which was rejected by the new school. In effect, Peirce was critical of both schools of political economy in the 1880s in the United States even as the discipline was forming its first professional association in America.

Just five years later Peirce (1898) gave the Cambridge Conference Lectures. Here again one finds a few comments related to economics. In the second lecture, “Types of Reasoning Processes”, Peirce outlines his conceptions of human reasoning processes. They are given in the context of his elaboration of his theory of metaphysical categories. After that he presents the logic of three fundamental reasoning processes – induction, deduction, and abduction. In the lecture he made no mention of psychology or the psychology of logical processes. Apparently he was asked about this after the lecture:

Before beginning my lecture this evening I wish to add a few words in further reply to that question which after the last lecture took the uppermost place, namely, the question concerning logic being entirely independent of psychology . . . My proposition is that logic, in the strict sense of the term, has nothing to do with how you think. (Peirce 1898: 143).

At this point, Peirce describes a game of chance involving a bank and also the economic circumstances facing an insurance firm. These examples are also illustrations of the theory of probability and games. Any contemporary economist now would recognize them as part of economics but non-exclusively. That is they may belong to several different disciplines. Thinking about the insurance firm, as a matter of logic one would like to know whether or not it is losing money. Here Peirce claims: “consideration of the ways in which the thinking of the matter is done is no more germane to the logical question, than it would be to inquire whether the proposition was written in the English or the Hungarian language”.¹⁹ From the insurance firm and banking, Peirce turns to a group of reasoners, mathematicians, who excel at deductive reasoning. He claims that their inferences are independent of psychology:

¹⁸ For writings relating to the *methodenstreit* between the two schools of economics see Ely (1884; 1886a; & 1886b) and Newcomb (1884; 1885; 1886b; 1886c).

¹⁹ Peirce (1898: 144).

Yet the mathematicians neither know, nor pretend to know, nor care, by what psychological machinery their hypotheses were thought. It would be a strange thing that they should combine this ignorance and indifference with so high a degree of skill if it were really essential to the solution of questions of deductive logic to consider how we think. I would not believe it until some man showed that by such consideration he could advance the reasoning of the mathematicians in an eminent degree (Peirce 1898d: 145).

Going forward another five years to 1903, one finds Peirce again giving lectures with the aim of providing a comprehensive overview of pragmatism. These “Harvard Lectures on Pragmatism” are considered as one of his major contributions to philosophy. He begins in the first lecture by both stating and restating his pragmatic maxim. He tells his audience that he is not going to repeat the examples of his 1878 essay, “How to Make Our Ideas Clear”. Instead Peirce offers other examples – a game of chance for banking and another for coin-tossing. A third example is the insurance firm. In the letters exchanged before the Harvard Lectures, we find William James (1903) asking Peirce not to go into the very abstract logic of the sort found in his “Minute Logic” (1902). Instead in the first lecture Peirce appears to substitute the mathematical economics of the profit maximizing insurance firm. Explicitly using optimizing equations and a reasoning process found in microeconomics, Peirce offers the first order condition for the profit-maximizing number of insurance policies and two variations of that condition – for one policy more and for one policy less than the profit maximizing number. There is no doubt that the calculus of the insurance firm seems out of place in a set of lectures that are otherwise without any formal presentation of logic or mathematics. The calculus of the insurance firm clearly transcends the theory of probability and chance and embraces economics. But the point Peirce was making was similar to what he had made previously in the Cambridge Conference Lectures, that mathematics and logic – and by implications economics – were independent of psychology. In case his audience did not get the point he was making, he took a moment to claim that his original statement making the maxim of pragmatism a matter of psychology and belief was very unsatisfactory:

My original article carried this back to a psychological principle. The conception of truth according to me was developed out of an original impulse to act consistently, to have a definite intention. But in the first place, this was not very clearly made out, and in the second place, I do not think it satisfactory to reduce such fundamental things to facts of psychology (Peirce 1903, EP11: 140).

Peirce’s comment in the Wundt review praising economics and aligning his logical and semiotic interpretation of economics with pragmatism and a philosophy of common sense realism is a third important instance of this sort of comment on economics or economically related instances of the logic of sampling, games,

and probability. In 1898 in the Cambridge Conference Lectures and five years later in the 1903 Harvard Lectures, Peirce had directed interpretations of pragmatism away from psychology towards a logical-semiotic view which he chose to illustrate with examples that would now be considered as part of mathematical economics. Most economists still bring some combination of empiricism and utilitarianism as an intellectual context for interpreting what has become an extremely complex mathematical discipline. Nothing can be clearer than the fact that Peirce had a different intellectual framework for economics. Perhaps economists should pay more attention to Peirce who believed that pragmatism, semiotics, and the philosophy of common sense provided a broader frame of understanding for economics and mathematical economics.

Shannon Dea¹

74 The River of Pragmatism

... Any philosophical doctrine that should be completely new could hardly fail to prove completely false; but the rivulets at the head of the river of pragmatism are easily traced back to almost any desired antiquity. Socrates bathed in these waters. Aristotle rejoices when he can find them. They run, where least one would suspect them, beneath the dry rubbish-heaps of Spinoza. Those clean definitions that strew the pages of the *Essay concerning Humane Understanding* (I refuse to reform the spelling), had been washed out in these same pure springs. It was this medium, and not tar-water, that gave health and strength to Berkeley's earlier works, his *Theory of Vision* and what remains of his *Principles*. From it the general views of Kant derive such clearness as they have. Auguste Comte made still more – much more – use of this element; as much as he saw his way to using. Unfortunately, however, both he and Kant, in their rather opposite ways, were in the habit of mingling these sparkling waters with a certain mental sedative to which many men are addicted – and the burly business men very likely to their benefit, but which plays sad havoc with the philosophical constitution. I refer to the habit of cherishing contempt for the close study of logic. (CP 5.11, 1906).

Between 1901 and 1910 in at least eight different loci,² Peirce sought to identify his pragmati(c)ist progenitors in the philosophical canon. The above passage, from an unpublished manuscript of that period, is the most evocative of them all, and features the longest list of proto-pragmatists: Socrates, Aristotle, Spinoza, Locke, Berkeley, Kant, and Comte. In the paragraph immediately following it, Peirce recounts the birth of American Pragmatism at the meetings of the now-famous Metaphysical Club. In the overall discussion, two things are striking – the inclusion of Spinoza in a list of historical figures more empiricist than rationalist, and the diminished role Peirce accords to William James, the figure most popularly associated with pragmatism in 1906.³

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² N 3.36 (1901); N 3.178 (1904); CP 5.412 (1905); CP 5.525 (1905); CP 8.206 (1905); CP 5.11 (c. 1906); CP 6.482 (1908); & CP 6.490 (1910). In total, Peirce makes six references each to Kant's and Berkeley's pragmati(c)ism and five to Spinoza's. The only other figure to be mentioned more than once is Locke, whom Peirce twice credits with pragmatic tendencies.

³ In his CP 5.12 discussion of the Metaphysical Club, the only role in the development of pragmatism that Peirce attributes to James is occasionally hosting the meetings. In later portions of the same manuscript, Peirce is at pains to characterize pragmatism as a sufficiently large tent to contain both him and James despite the fact that there was some distance between their views, this distance implied by Peirce's remark that Schiller "seems to occupy ground of his own, intermediate ... between those of James and mine" (CP 5.466).

I wish to suggest that, in both of these respects, this passage aptly captures Peirce's motivations throughout the decade for identifying pragmatists in the philosophical canon. Put simply, it was precisely James's popularization of pragmatism that inspired Peirce, in the first decade of the twentieth century, to identify philosophers whose views were close to his own, and to distance himself from those pragmatists to whose expression of the method Peirce most objected. Thus, his lists of proto-pragmatists and his occasional diminishment of James's pragmatism are of a piece with his 1905 identification of his own doctrine with "pragmaticism", a word "ugly enough to be safe from kidnappers" (CP 5.414).

Examining Peirce's efforts from the period to stake out his own position as well as texts from the same period by the main figures of early twentieth century pragmatism reveal the growing gap in the period between two approaches to pragmatism. As early as 1915, John Thomas Driscoll described two competing strains in pragmatism – the Absolute Idealism of Royce and the ("Empiric") Phenomenal Idealism of James and Dewey.⁴ While Driscoll does not name him, Peirce was very clearly on the side of the Absolute.

In what follows, I briefly outline the schism between the anti-metaphysical "empiric" pragmatists – James among them – and those pragmatists like Peirce and Royce who retained a place for the Absolute in their systems. Within this dialectic, Peirce's invocation of Spinoza as a kindred spirit signals both Peirce's own commitment to metaphysics and, more strongly, his view that pragmatism, properly understood, must not *tout court* reject metaphysics. The story is a rich one, of which my brief account is merely suggestive. What should be clear, however, is that Peirce's praise of Spinoza is neither careless nor inconsistent with his thought or, indeed, with the early twentieth-century development of pragmatism.

Pragmatism and Metaphysics

Peirce explicitly criticized James's anti-metaphysical stance in an 1891 review for *The Nation* of *The Principles of Psychology*, arguing that "to call a branch of an inquiry 'metaphysical' is merely a mode of oburgation, which signifies nothing but the author's personal distaste for that part of his subject".⁵ Peirce reiterated this criticism of James in 1882⁶ and twice again in 1901.⁷ Then, in a 1905 note in

⁴ Driscoll 1915: 10.

⁵ N 1.105.

⁶ N 1.152–53.

⁷ N 3.35, 3.49.

The Nation, Peirce described a schism between those pragmatists, like James, who reduce metaphysics to function and those, like Peirce, who attend to the functional aspects of metaphysical questions without throwing out all metaphysics.⁸

A concern for pragmatically meaningful metaphysics is the main feature that Peirce took to distinguish pragmatism from other varieties of what he termed “prope-positivism”. In a 1905 article for *The Monist*, he put it this way:

... pragmatism is a species of prope-positivism. But what distinguishes it from other species is, first, its retention of a purified philosophy; secondly, its full acceptance of the main body of our instinctive beliefs; and thirdly, its strenuous insistence upon the truth of scholastic realism... So, instead of merely jeering at metaphysics, like other prope-positivists, whether by long drawn-out parodies or otherwise, the pragmatist extracts from it a precious essence, which will serve to give life and light to cosmology and physics. (CP 5.423).

Peirce’s remark that pragmatism must insist upon the truth of scholastic realism echoed comments that he had made to James in a letter of March 7, 1904. “You and Schiller [wrote Peirce] carry pragmatism too far for me. I don’t want to exaggerate it but keep it within the bounds to which the evidences of it are limited. The most important consequence of it, by far, on which I have always insisted . . . is that under that conception of reality we must abandon nominalism” (CP 8.258).

For Peirce, nominalism amounts to a kind of atomism. On his account, nominalists deny the reality of laws and relations because their ontology leaves room only for fully determinate individuals. By contrast, Peirce’s synechism includes both existent individuals and two kinds of indeterminate being – possibility, which is indeterminate in the sense of being vague, and law, which is indeterminate because it is general. On Peirce’s account, while neither possibilities nor generals *exist*, they are nonetheless real. They are not, as moderate nominalists maintain, epiphenomenal upon existent individuals since, for Peirce, indeterminacy is more primordial than determinacy. In the Peircean ontology, individuals are evanescent phenomena of a reality that is, at bottom, continuous, not discrete.

Peirce’s desire to distinguish himself from James was mutual. In two 1907 lists of pragmatists, James included himself, Dewey and Schiller, but not Peirce. The first list occurs in a *New York Times* interview. James there addresses the reasons for the confusion over pragmatism then prevalent, observing that “Dewey is obscure; Schiller bumptious and hasty; James’s doctrine of radical empiricism, which has nothing to do with pragmatism and sounds idealistic, has been confounded with his pragmatism”.⁹ Peirce’s name is notably absent.

⁸ N 3.234.

⁹ James, “An Interview”, 134. Indeed, Peirce was one of those who confounded the two doctrines. See CP 5.414.

In his *Pragmatism* of the same year, James refers to pragmatism as “Messrs. Schiller’s, Dewey’s and my own doctrine of truth”.¹⁰ Again, Peirce’s name – particularly in light of James’s discussion early in the same chapter of his role in the history of pragmatism – is conspicuous for its absence.

The context of this second list is especially interesting. James invokes the figures that he does over the course of a discussion of ideas of God and the Absolute. The development of Darwinism, argues James, has undercut theism for “men who are strongly of the fact-loving temperament”. Therefore, he continues

... some kind of an immanent or pantheistic deity working *in* things rather than above them is, if any, the kind recommended to our contemporary imagination. Aspirants to a philosophic religion turn, as a rule, more hopefully nowadays toward idealistic pantheism than toward the older dualistic theism, in spite of the fact that the latter still counts able defenders.¹¹

James’s reference here to immanent, pantheistic, idealistic conceptions of God would seem to suggest that, like Peirce, he regarded Spinozism as compatible with his own doctrine. This is belied by the very next paragraph:

But ... the brand of pantheism offered is hard for them to assimilate if they are lovers of fact, or empirically minded. It is the absolutistic brand, spurning the dust and reared upon pure logic. It keeps no connection whatever with concreteness. Affirming the Absolute Mind, which is its substitute for God, to be the rational presupposition of all particulars of fact, whatever they may be, it remains supremely indifferent to what the particular facts in our world actually are.

James continues that the pragmatism that he, along with Dewey and Schiller, espouses enjoins us to accept “*whatever proves itself to be good in the way of belief... unless, indeed, belief in it incidentally clashed with other greater vital benefits*”.¹² On James’s account, belief in the Absolute clashes with other benefits in just this way: “It happens to be associated with a kind of logic of which I am the enemy, I find that it entangles me in metaphysical paradoxes that are unacceptable [*sic*], etc., etc. But as I have enough trouble in life already without adding the trouble of carrying these intellectual inconsistencies, I personally just give up the Absolute”.¹³

¹⁰ James, “What Pragmatism Means” 223.

¹¹ “What Pragmatism Means” 221.

¹² “What Pragmatism Means” 223–34.

¹³ “What Pragmatism Means” 225.

The Battle of the Absolute

James's reference to the "Absolute Mind" reveals the pantheism that he has in mind to be not Spinoza's but Royce's. Over the course of the nearly three decades that Royce and James were friends, colleagues and neighbours, they were also each others' opponents in what came to be called "The Battle of the Absolute". For Royce, God is the Absolute Mind comprising all of reality – including elements of it that appear mutually inconsistent. James rejected the view on both moral and methodological grounds. With respect to the former, James argued that, if both good and evil are contained in God, then "evil is 'overruled' already . . . [and] we have a right ever and anon to take a moral holiday",¹⁴ a view that James regarded as incompatible with moral responsibility. With respect to Royce's methodology, James maintained that the notion of the Absolute, reared as it is "upon pure logic",¹⁵ is the product of rationalism, but pragmatism "widens the field of search for God" beyond rationalism, which "sticks to logic and the empyrean", and empiricism, which "sticks to the external senses".¹⁶ "Pragmatism", writes James, "is willing to take anything, to follow either logic or the senses and to count the humblest and most personal experiences . . . Her only test of probable truth is what works best in the way of leading us, what fits every part of life best and combines with the collectivity of experience's demands, nothing being omitted".¹⁷

While James aimed these criticisms at Royce and not Spinoza, it is clear that the conception of the Absolute that we find in Spinoza's infinite substance must stand or fall with Royce's. James's moral criticism was one already taken up against Spinoza by Bayle, and his methodological criticism is a direct attack on rationalism. While there are differences between Spinoza's and Royce's absolutisms – most notably, Royce regarded God as an individual, a position that Spinoza famously rejected – there were also considerable similarities, similarities that made Spinoza's doctrine a potential casualty in the Battle of the Absolute.

That James associated the brand of pragmatism that rejects the Absolute with Dewey and Schiller but not with Peirce should not be surprising. Peirce was on Royce's side.¹⁸ In a 1902 letter to Royce, Peirce wrote that "Your state-

¹⁴ "What Pragmatism Means" 222–223.

¹⁵ "What Pragmatism Means" 221.

¹⁶ "What Pragmatism Means" 225.

¹⁷ "What Pragmatism Means": 225.

¹⁸ To be sure, though, Peirce still had complaints about Royce – among these, he deplored Royce's logic, and complained that his Absolute Mind is not what people understand by "God".

ment of the relation of the individual to God is sublime and fit to satisfy the soul in life and in the hour of death. It must stand for age after age".¹⁹ Then, in 1903, in a new introduction for his 1877 "The Fixation of Belief", Peirce acknowledged that James had brought the chief thesis of "Fixation" and 1878's "How to Make Our Ideas Clear" to the attention of the philosophic community, but complained that he had pressed that thesis "further than the tether of their author would reach, who continues to acknowledge, not indeed the Existence, but yet the Reality, of the Absolute, nearly as it has been set forth, for example, by Royce in his *The World and the Individual*, a work not free from faults of logic, yet valid in the main".²⁰ Similarly, in the very same fragment in which he described Spinoza's place in the "river of pragmatism" Peirce observed that he and James "differ on important questions of philosophy – especially as regards the infinite and the absolute".²¹

None of this is to say that Peirce's reception of Spinoza was the result of any influence upon the former by Royce. Royce was much more influenced by Peirce than Peirce was by Royce. Royce claimed to have a "special obligation" to Peirce "not only for the stimulus gained from his various published comments and discussions bearing upon the concept of the Infinite, but for the guidance and the suggestions due to some unpublished lectures of his which [he] had the good fortune to hear".²² Moreover, it was in response to a suggestion by Peirce that Royce began the serious study of logic, and his later work – in particular, his so-called "absolute pragmatism" – is heavily informed by Peirce's semiotics.

However, the Battle of the Absolute helps us to better understand both Peirce's decision to coin the term "pragmaticism" and his emerging conviction that Spinoza was a pragmatist. By 1901–1910 – the period when Peirce was re-evaluating both his relationship to other pragmatists and his understanding of Spinoza – it would have been impossible for Peirce to fail to take an interest in the Battle of the Absolute. Both James and Royce – and of course the doctrine of pragmatism – had achieved considerable fame by this time, and Peirce was close to all three of them. And, Peirce himself had spent the *interregnum* between his discovery of the pragmatic maxim and James's announcement of same to the broader philosophic community working closely on material concerning the Absolute. He was delighted by the bit of fame that accrued to him as pragmatism's founder, but dismayed by the anti-metaphysical strain that came to be associated with pragmatism over the course of James's interventions

¹⁹ CP 8.117n.12.

²⁰ CP 5.358n.1.

²¹ CP 5.466.

²² Royce 1959: 1.xix.

in the Battle of the Absolute. Although it is not usually characterized in this way, Peirce's coining of the term "pragmatism" may, in this light, be understood as part of the fall-out of the controversy between Royce and James.

If so, then Peirce's identification of Spinoza as a pragmatist makes considerable sense. Already in the 1890s, Peirce regularly praised Spinoza's conception of the Absolute.²³ Moreover, in 1902, in response to the publication of his *The World and the Individual*, Peirce wrote to Royce that "In many places you remind me of Spinoza who uses arguments to my mind of no value but with an unexpressed undercurrent of weighty thought".²⁴ Peirce's characterization of Royce's Absolute as an "immanent or pantheistic deity working *in* things rather than above them . . . reared upon pure logic" further confirms the connection in Peirce's mind between Royce and Spinoza. Thus, in the "river of pragmatism" passage, Spinoza stands as a symbol for the role that, on Peirce's view, metaphysics and a conception of the Absolute should play within pragmatism. In including Spinoza in the river, he is at once including Royce and excluding James.

²³ See Peirce, "Spinozism", N 1.164–65, and N 2.86. See also Dea, 2007, 167–89, and 2008.

²⁴ NEM III/2: 956.

Priscila L. Farias¹

75 Visualizing Reason

Diagrammatic reasoning is the only really fertile reasoning. (CP 4.571, 1906).

In a passage of his ‘Prolegomena to an apology for pragmatism,’ published on issue 16 of *The Monist*, and where he introduces his *existential graphs*, Peirce makes the claim quoted above. This assertion demonstrates how strongly Peirce argues, in several passages of his work, for a kind of reasoning that is eminently visual, based on the elaboration and manipulation of diagrams.

At various times (e.g. CP 1.369; CP 4.447; W6: 259; EPII: 10, 303) Peirce refers to *diagram* as a synonym, or an example of an icon. The concept of a diagram as a specific kind of icon, among other possible kinds, becomes clearer from the formulation of a typology of tangible icons, or hypoicons, made by Peirce in the section devoted to speculative grammar of his 1903 *Syllabus* (CP 2.276–277; EPII: 273–274).

Parallel to that, Peirce has always emphasized the role of diagrams in reasoning – especially, but not exclusively, in mathematical logical and thinking – providing several examples of the operation of what he called, in some occasions, *diagrammatic reasoning* (CP 4.571; CP 5.148; CP 6.213). In this context, the development of his systems of logic diagrams, and especially his *existential graphs*, must be understood as an effort to put into practice his arguments in favor of an eminently visual, and supposedly more intuitive form of reasoning.

For Peirce, diagrams are indispensable in mathematics and of extreme importance in logic (CP 4.544), although their contribution is not limited to these areas of knowledge. According to him, if logic can be defined as the science of the laws that regulate the establishment of stable belief, *exact logic*, as a doctrine of the conditions that underlie logic should be based on for a kind of thought whose observations are ‘perfectly undoubted’ (CP 3.429). This is, according to him, the case of diagrammatic (also called ‘iconic’ or ‘schematic’) reasoning or thinking. In 1901, Peirce described the process involved in this type of reasoning as follows:

We form in the imagination some sort of diagrammatic, that is, iconic, representation of the facts ... This diagram, which has been constructed to represent intuitively or semi-intuitively the same relations which are abstractly expressed in the premisses, is then observed, and a hypothesis suggests itself ... In order to test this, various experiments are made upon the diagram, which is changed in various ways... The conclusion is compelled to be true by the conditions of the construction of the diagram. (CP 2.778).

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On several occasions, Peirce stressed the importance of diagrams in deductive or necessary reasoning (CP 1.66; CP 2.267; CP 3.363; CP 5.162; CP 6.471), and even asserted that every regularly stated syllogism is a diagram (CP 4.544). According to Stjernfelt (2000), diagrammatic reasoning, as proposed by Peirce, can be understood as a process that ‘provides a formal deductive reasoning core, embedded in the trial-and-error procedure of abductive suggestions and inductive tests’ (Stjernfelt 2000: 374). This kind of reasoning would therefore have as main advantages the ability to reveal ‘new truths,’ not detectable from a simple listing of the issues presented by a problem, and the ability to lead to testable, correct and necessary conclusions.

According to Peirce, these advantages are not restricted to the fields of mathematics and logic – something that, considering the foundational position of mathematics in his classification of sciences, is perfectly expected. For him, philosophy and metaphysics also benefit from adopting this kind of reasoning. As to the applicability and advantages of diagrammatic reasoning to the theory of signs, we have no doubt about this if we recall that, for Peirce, *semiotics* is just another name for *logic* “in its general sense”, consisting in “the quasi-necessary, or formal, doctrine of signs” (CP 2.227).

Although in 1885 Peirce had already written that ‘the diagram, indeed, so far as it has the general signification, is not a pure icon’ (CP 3.362), it is only in 1903 that he draws further consequences from this statement. Not by chance, Peirce does this in a section of the *Syllabus* dedicated to speculative grammar (CP 2.274–77, EPII: 272–288). This is precisely the branch of semiotics – understood as logic – that investigates the nature of signs, their conditions of existence and classification.

He starts with a more rigorous definition of his concept of an icon, differentiating ‘icons’ from ‘iconic signs’:

... most strictly speaking, even an idea, except in the sense of a possibility, or Firstness, cannot be an Icon ... But a sign may be iconic, that is, may represent its object mainly by its similarity, no matter what its mode of being. If a substantive be wanted, an iconic representamen may be termed a hypoicon. (CP 2.276; EPII: 273).

Soon after that, in that which, according Jappy (2001), might be the only complete definition of hypoicons that we find in his work, Peirce describes the following division:

Hypoicons may be roughly divided according to the mode of Firstness of which they partake. Those which partake of simple qualities, or First Firstnesses, are images; those which represent the relations, mainly dyadic, or so regarded, of the parts of one thing by analogous relations in their own parts, are diagrams; those which represent the representative character of a representamen by representing a parallelism in something else, are metaphors. (CP 2.277; EPII: 274).

Thus, we can say that, strictly speaking, a ‘pure icon’ is just a logical possibility, not something existent. Iconic signs, or hypoicons, on the other hand, are instantiated icons, participating in existing sign relations, due to some kind of similarity they have with their objects. In this context, *diagrams* may be defined as hypoicons whose relation to its object is based, first and foremost, on structural similarity. If we agree that icons are relations of similarity, a diagram can be defined as an instantiated icon of the relations between the parts of its object. *Diagrams*, in this sense, differ from *images*, which are instantiated icons of immediate, apparent or superficial qualities, and from *metaphors*, which are instantiated icons of habits, conventions or laws.

Following the logic of categories governing Peirce’s semiotics, we should also expect *metaphors* to present themselves in the form of diagrams, expressing habits based on structural similarities and that depend on their insistence to acquire their status as conventions or laws. *Diagrams*, in turn, should depend on the incorporation of *images* to be recognized as analogous to the structure of their objects, while, at the same time, minimally complex *images*, from the moment they are seen as compounds of simpler elements, can be understood as *diagrams*. This demonstrates the central position of the diagrams in Peirce’s notion of an icon.

Peirce provides as examples of iconic sinsign and iconic legisign, respectively, ‘an individual diagram’ (CP 2.255) and ‘a diagram, apart from its factual individuality’ (CP 2.258). In the context of the 10 classes of signs, iconic sinsigns are signs that, from the point of view of their nature, are actual, existing entities (not mere qualities or general laws); that relate to their objects by virtue of their own characteristics (and not factually, or through general rules), and that, like all icons, present their objects to interpreters as signs of possibility (and not as signs of fact, or of law).

In the context of the 10 classes, there is only one kind of iconic sinsign. In the context of the 66 classes, however, we have up to 12 kinds of iconic sinsigns, which can be differentiated according to the nature of their object. The object of the sign, in turn, is analyzed according to two aspects in the context of the 66 classes: first, as dynamic object (the object as it appears outside the sign), and then, as immediate object (the object as it is represented within the sign). Once sinsigns are existential, their objects are by force of the nature of real facts or of general laws, and never of the nature of possibilities. This question may have interesting consequences for the analysis of graphic artifacts in the context of visual communication, once it leads us to think about the characteristics of the elements involved in the configuration of a visual representation in terms of the possibilities of representation suggested by the object that is being represented.

In my PhD dissertation (Farias 2002), I pointed out to the need for a better understanding of Peirce's hypoicons, arguing that they could be understood as different kinds of iconic sinsigns, and suggesting that, within the context of the 66 classes of signs, this understanding would gain a dimension richer than the one obtained in the context of the 10 classes. This hypothesis was explored in two papers published with João Queiroz (Farias & Queiroz 2006 & 2009). In these works, the issues presented in this chapter are analyzed in more detail.

In the context of the 66 classes, triadic relations between the sign, its dynamic object, and its final interpretant, are determined by the kind of relationship that the sign keeps with its dynamic object. In the case of icons, this is a relationship based on qualities (and not on facts or general rules), and therefore the remaining relationships will always be based on possibility, suggestion, or instinct. Thus, although visual representations of this kind cannot always ensure consistent and coherent interpretations, they are more likely to provide new ideas and new knowledge. It is in this sense, I believe, that we should understand Peirce's statement about the unique and productive character of diagrammatic reasoning.

Vincent Colapietro¹

76 Self-Control, Self-Surrender, and Self-Constitution: The Large Significance of an “Afterthought”

This [esthetic] ideal, by modifying the rules of self-control[,] modifies action, and so experience too, – both the man’s own and that of others, and this centrifugal movement thus rebounds in a new centripetal movement, and so on. (5.402n3, 1906).

We ought to be especially grateful to Charles Hartshorne and Paul Weiss, the editors of *The Collected Papers of Charles Sanders Peirce*, for appending to “How to Make Our Ideas Clear” two substantive footnotes from unpublished manuscripts. These notes point toward the eventual context in which Peirce located his pragmatic maxim (“Consider what effects, that might conceivably have practical bearings, we conceive the object the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object” (CP 5.402)). This context is far from a narrowly logical one pre-occupied solely with the exigencies of inquiry; it is, indeed, an encompassing moral vision of autonomous agents. It borders on, if it does not actually spill over into, a religious vision of human life (CP 5.402 n3; cf. CP 7.72).

The text that I have selected is from one of these footnotes (CP 5.402 n3). In this instance, this means that it is from one of Peirce’s unpublished manuscripts², but one that I, along with most other students of Peirce, encountered first as a fragment appended by the editors of the *Collected Papers* to his most famous essay. This is a vivid reminder that the Peirce whom we know is an extraction from a voluminous body of still unpublished writings: even the best known of his writings need to be seen in light of largely unknown texts. The fuller context is not a readily available one. For the conscientious expositor at least, this reminder itself carries a directive: Go to the source – that is, go to the unpublished manuscripts but also the chronological edition so painstakingly being brought out by the Peirce Edition Project. The philosophical reconstruction of Peirce’s considered position on any given topic is very often entangled with the archival recovery of unknown (or simply neglected) manuscripts. This is nowhere

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² To be exact, it is from one of his largely unpublished manuscripts. Of course, the passages quoted as a note in volume 5 of *The Collected Papers* requires me to qualify my description of this manuscript (“Issues of Pragmatism” as unpublished).

truer than in the case of reconstructing his pragmatism. Given Peirce's own preoccupation with method, then, it seems especially apposite to stress this point regarding the most appropriate way of approaching the delicate task of interpreting Peirce's challenging texts.

What happens when one actually does go to the source of 5.402 n2? Indeed, apart from considerations of method, what about the substance of the passage to which I would like to call the attention of the community of interpreters? The editors of the *Collected Papers* identify the source of this fragment in this manner: "From 'Consequences of Pragmaticism', 1906". But an alternative title of this manuscript, actually written in 1905, appears to be "Issues of Pragmaticism".³ Turning to the manuscript itself (MS 290 in Robin's *Catalogue*), our efforts are richly rewarded by (at least) two discoveries. The first concerns an addition (or insertion), whereas the second concerns a deletion.

The text on which I am focusing is, in fact, an insertion, an afterthought not in the conventional sense but in what might be identified as the *deliberative* sense (a sense in effect expressed by saying to oneself, "*After* giving the matter due consideration, I am led to hold . . ."). However paradoxical it might sound, an afterthought in the deliberative sense might be virtually spontaneous. That is, it might emerge *in* the flow of signs, not after they have run their course. For example, one is writing a sentence immediately on the heels of a previous sentence but then realizes (if only in the most inchoate or implicit manner) the need to mediate between the two claims. And one does so more or less "immediately", that is, spontaneously (or extemporaneously). As a result, the mediating insertion can be as spontaneously inscribed in the flow of words as the two unmediated sentences were initially inscribed. In general, writing is a process in which countless afterthoughts in the deliberative sense are allowed to insert themselves in the ongoing flow of what is always, in some measure, an instance of uncontrolled and indeed uncontrollable semiosis (or sign-activity). In the conventional sense, an afterthought is what occurred to us after the occasion has passed ("I wish that I had the presence of mind at the time to say . . ."). In the deliberative sense, however, it is what frequently occurs to us *in* the very process

³ Though in a box in the upper left hand margin of the manuscript bears the inscription "CP" for "Consequences of Pragmaticism" the title "Issues of Pragmatism" with *The* crossed out, appears on the first page. Is this title ("Issues of Pragmatism") itself an afterthought? I will not even attempt to solve this riddle at this point. André De Tienne, Cornelius de Waal, and David Agler have been very helpful in identifying and dating this manuscript as well as offering other valuable suggestions. In addition, encouragement from Robert Innis regarding this essay has been critical.

of semiosis. Authorial conscience prompts us to stutter – to hesitate, to arrest (however briefly) our linguistic fluency. Very often, authorial afterthoughts are virtually simultaneous thoughts: what qualifies them as *after* is (for the most part) only discoverable by consulting original manuscripts with their frequently marred surfaces (words, phrases or entire sentences crossed out, but also ones added as insertions).

We are not in the position to know at what point Peirce inserted his remarks about “This ideal . . . modifies action, and so experience too . . .” into the text of MS 290. It might have been *very* soon after he penned the sentences between which these remarks are placed; or it might have been some time later.⁴ The question of how (to use an expression borrowed from Henry James, Sr.) the *vir* is begotten (cf. Krolikowski 1964; Colapietro 1989, 111) was, for Peirce writing in 1905, inextricably linked to how an inquiry *ought* to be conducted. Conscientious adherence to the pragmatic maxim is but a part (possibly a small part) of what is required of the responsible inquirer. In turn, responsible inquiry is only one face (and not necessarily the most human face) of our deliberative agency. Such agency extends itself not only to the espousal of ideals but also the ongoing cultivation of a truly deliberative stance toward our ultimate ideals. In other words, if we fail to deliberate over the course of our lives about what ideals are worthy of our espousal, then we fail to be adequately deliberative and, therein, fall short of becoming as fully autonomous as we *ought* to be.

At the conclusion of the passage that I have selected for this volume, as it is found in the manuscript, one reads: “*So far as it goes, this seems to me a legitimate outcome of pragmatism*” (37; emphasis added). In the manuscript, *the* is crossed out and *a* inserted – not *the*, but *a* legitimate outcome. This sentence is, however, omitted from the footnote in the *Collected Papers* (5.402 n3: 260). Hence, our gratitude toward the editors of the *Collected Papers* is tempered when we realize that a critical sentence has inexplicably been omitted from the appended fragment. The qualification in the omitted sentence (“So far as it goes . . .”) is telling, while the implication that even more might be derived from pragmatism is intriguing.

The “indefinite replication of self-control upon self-control” is, for Peirce, linked to the abiding need for self-surrender. “It is”, Peirce notes, “a common observation that those who dwell continually upon their expectations are apt to become oblivious to the requirements of the actual station. *The great principle of*

⁴ The insertion seems to have been made on the spot, rather than later. Having completed the paragraph, Peirce appears to have inserted this passage between the last two sentences of the paragraph he had just written, before going on to the next paragraph (as it turns out, the next page as well). I am encouraged by the fact that this is also David Agler’s interpretation.

logic is self-surrender, which does not mean that the self is to lay low for the sake of an ultimate triumph. It may turn out so; but that must not be the governing purpose”⁵ (CP 5.402 n2: 259; emphasis added).

From a Peircean perspective, then, the pragmatic context of responsible inquiry is, indeed, incomprehensible without reference to the deliberate cultivation of an ever more robust sense of moral autonomy. The cultivation of this sense drives us ever inward, for it requires us to deliberate about our motives, our habits, and ultimately our character. But it also drives us ever outward, for it entails an examination of our entanglements with the world, in particular, the possibly expansive reach of our autonomous agency.⁶ For the conscientious person, the centrifugal movement rebounds in the opposite direction, generating a centripetal movement, and eventually this centripetal movement itself rebounds, unleashing a centrifugal movement – “and so on”. Action and experience itself are being continually modified by this process. So, too, are the originally inchoate exertions of the human animal; to some extent, these inchoate impulses eventually assume the form of autonomous agency. The *vir* is begotten (CP 5.402 n3: 260).

By the very circumstances of our lives, we are, in effect, charged with the task of cultivating a character on which not only others but also we ourselves can count. We can, after all, betray or simply disappoint ourselves. We can be our own worst enemies, our most treacherous allies. In any event, this task of cultivating our character encompasses both self-control and self-surrender (CN 1: 188–89; Colapietro 1989: 96). One of the most important forms of human self-control is that manifest in painstakingly linking our conceptions to the disclosures of our experience: the translation of concepts into other concepts ultimately needs to be arrested and re-directed toward the translation of our conceptions into observable effects and experiential disclosures. In turn, the most important form of human self-surrender is that discernible in giving ourselves unqualifiedly to what we ourselves have come to see as inherently admirable (or, as Peirce sometimes says, intrinsically adorable). For him, this ideal is the continuous growth of concrete reasonableness. It is hard, for me at least, to imagine a goal more worthy of our adherence. The task of making *ourselves* worthy advocates of this Peircean ideal encompasses the centrifugal and centripetal movements so suggestively identified by Peirce in “Issues of Pragma-

⁵ This passage is from 5.402 n2, not 5.402 n3. It was written more than a decade before “Issues of Pragmaticism”. Even so, there is substantive agreement between the two manuscripts regarding the topic of self-surrender.

⁶ The individual “grows an esthetic ideal, not for the behoof of his own poor noodle, but as the share which God permits him in the work of creation” (5.402 n3; cf. CP 7.572).

tism". It connects directly with his pragmatism. But it points expansively beyond the somewhat narrow limits of heuristic concerns (i.e., those pertaining to the theory of inquiry). Finally, it points, however vaguely, to the ultimate context in which human agents must imagine themselves in order to obtain the higher grades of autonomous agency. This context is nothing less than the drama of creation in which we are destined to play a role, perhaps a cosmically insignificant role but a humanly momentous one.

Marcel Danesi¹

77 The Peircean Concept of Existential Graph and Discovery in Mathematics

But why do that [use maps] when the thought itself is present to us? Such, substantially, has been the interrogative objection raised by an eminent and glorious General. Recluse that I am, I was not ready with the counter-question, which should have run, "General, you make use of maps during a campaign, I believe. But why should you do so, when the country they represent is right there?" Thereupon, had he replied that he found details in the maps that were so far from being "right there", that they were within the enemy's lines, I ought to have pressed the question, "Am I right, then, in understanding that, if you were thoroughly and perfectly familiar with the country, no map of it would then be of the smallest use to you in laying out your detailed plans?" No, I do not say that, since I might probably desire the maps to stick pins into, so as to mark each anticipated day's change in the situations of the two armies". "Well, General, that precisely corresponds to the advantages of a diagram of the course of a discussion. Namely, if I may try to state the matter after you, one can make exact experiments upon uniform diagrams; and when one does so, one must keep a bright lookout for unintended and unexpected changes thereby brought about in the relations of different significant parts of the diagram to one another. Such operations upon diagrams, whether external or imaginary, take the place of the experiments upon real things that one performs in chemical and physical research. (CP 4.530, 1906).

Introduction

During the last years of his life, Charles Sanders Peirce strove to come up with a full-fledged proof of his pragmatism. The dilemma he faced was how to justify the fact that the meaning of an object consists in the practical outcomes of our interaction with it and the fact that a sign is something which stands for something else for someone in some respect or capacity. For Peirce, these two aspects of semiosis had to be translatable into one another (CP 2.398–433). He believed that such a unification would incorporate pragmatism and semiotics into a unified ontological and epistemological theory of mind. The connecting link was his system of diagrammatic logic, which he called "Existential Graphs" (EGs) (CP 4.347–584). For Peirce a diagram or graph was more powerful than language as a model of reality because it showed how its parts resembled relations among the parts of some different set of entities in other domains. Therefore, a diagram is a sort of mapping of one group of relations onto another, displaying

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the essential nature of iconicity, metaphor, and analogy. EGs show not a linear or hierarchical succession of logical forms of thought, but the very process of thinking itself *in actu* (CP 4.6). In fact, Peirce called his graphs “moving pictures of thought” (CP 4.8–11) because through them one can literally *see* a given argument. In short, as Kiryushenko (2012: 122) puts it, “graphic language allows us to experience a meaning visually as a set of transitional states, where the meaning is accessible in its entirety at any given here and now during its transformation”.

In the quote above, Peirce makes the claim, essentially, that diagrams are keys to understanding real-world phenomena, allowing us to experiment with them through iconic modeling. The claim made in this essay is that EGs, and diagrams in general, are in fact the artifacts we use to make discoveries, as Peirce clearly implied. The focus will be on mathematics (Danesi 2013), but the concept of EGs as “discovery devices” applies to all domains of science. In this case, *seeing* something on paper and *understanding* how it works allows us to connect to that something in a cognitive way. In other words, because diagrammatic representamen mirrors the real-world object we can play with it in our minds by rearranging its parts in various ways to see what it yields. Thus, EGs offered Peirce the possibility of linking semiotics and pragmatics into a model of how discovery unfolds. As he points out in the quote above, diagrams are maps of thought, which may be used “to stick pins into” in order to mark anticipated changes.

Diagrams and Existential Graphs

The study of diagrams in semiotics, psychology, and mathematics has become a productive area of investigation in recent years (Shin 1994; Chandrasekaran, Glasgow & Narayanan 1995; Hammer 1995, Hammer & Shin 1996, 1998; Allwein & Barwise 1996; Barker-Plummer & Bailin 1997, 2001; Kulpa 2004; Stjernfelt 2007; Roberts 2009; Kiryushchenko 2012). In other words, the ideas of Peirce are beginning to gain a foothold in various domains of investigation, as, more and more, scientists of the mind discover that visual-iconic thinking is at the core of cognition generally. This explains the growth of interest in phenomenology and blending theory in cognitive science (for example, Lakoff and Núñez 2000) – trends that were prefigured by Peirce’s notion of “phaneroscopy”, which he described as the formal analysis of appearances apart from how they appear to interpreters and of their actual material content. Appearances are keys to discovering broad classes of appearances, along with their intrinsic features.

Peirce argued that discoveries in chemistry, for instance, were phaneroscopic, because chemical compounds could be studied not as mixtures of actual substances but as diagrammatic structures. Chemists discovered that the iconically-modeled structure of a molecule and transformations of chemical compounds themselves gave birth to the scientific language that revealed the inner life of nature. This implies that diagrams contain within them “virtual objects”, which are like real objects and can thus be used to experiment cognitively with the latter. Peirce wrote an entry on the concept of “virtual” for Baldwin’s (1902: 763) *Dictionary of Philosophy and Psychology*, defining a virtual object as follows:

A virtual X is something, not an X, which has the *efficiency* (virtus) of an X. This is the proper meaning of the word; but it has been seriously confounded with “potential”, which is almost its contrary. For the potential X is of the nature of X, but is without actual efficiency. A virtual velocity is something, not a velocity, but a displacement; [it is] equivalent to a velocity in the formula, “what is gained in velocity is lost in power”. (3) Virtual is sometimes used to mean pertaining to virtue in the sense of an ethical habit.

According to this definition, any virtual object is not mental copy of its real object, but a portrayal of its practical applications, predicting what and how it would produce other real objects. Thus, the virtuality of diagrams generally is what leads to discoveries. Peirce tended to attribute the source of his notion of virtuality to his own mathematical mindset, which he described as an interplay of maps and images. And from this, he saw logic as a form of diagrammatic thinking which superseded the power of writing and sentential logic to explain phenomena.

The notion of diagram extends to equations and other mathematical modeling artifacts. In effect, algebraic notation is a kind of diagrammatic strategy for compressing information, much like pictography does for representing referents iconically. An equation could easily be conceived as an EG of sorts. EGs can actually replace actual algebraic notations. As Kauffman (2001: 80) states, the graphs are powerful cognitively because they contain arithmetical information in an economical, and thus, structurally-expository form:

Peirce’s Existential Graphs are an economical way to write first order logic in diagrams on a plane, by using a combination of alphabetical symbols and circles and ovals. Existential graphs grow from these beginnings and become a well-formed two dimensional algebra. It is a calculus about the properties of the distinction made by any circle or oval in the plane, and by abduction it is about the properties of any distinction.

If one looks at the Pythagorean equation ($c^2 = a^2 + b^2$) as a graph, it can be seen to be a visual portrait of the relations among the variables (originally standing the sides of the triangle). But, being a graph, it also tells us that the variables

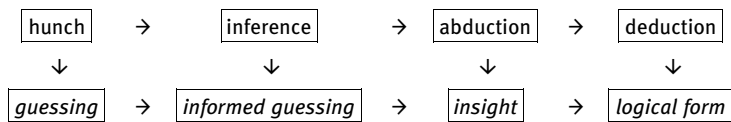
relate to each other in many ways other than geometrically. Expressed in language, we would literally not be able to see the possibilities that the equation presents us. To use Susan Langer's (1948) concept of discursive-versus-presentational representation, the equation tells us much more than the statement ("the square on the hypotenuse is equal to the sum of the squares on the other two sides") because it literally "presents" the structure inherent in the linguistic version, fleshing it out as an abstract form. We do not read a diagram, a melody, an equation, and so on, she emphasized, as made up of individual bits and pieces (notes, shapes, words, and so on), but *presentationally*, as a totality which encloses much more meaning. Describing it in language (with sentences) is a *discursive* process, forcing us to think of the information in a different, semantically-constrained way.

In effect, presentational forms are compressed icons, showing real-world objects in a holistic revelatory way. Further mathematical knowledge occurs by unpacking the inherent suggestive information from virtual forms to literally see what is in them. In a way, all mathematical notation is graphic, allowing mathematicians to experiment with it for advancing their work, but they also use language as well to explain their discoveries and to contextualize them in the real world. Mathematics is thus both a presentational and discursive craft. What a diagram does, like a map, is turn a real-world problem into a paper-and-pencil one and then suggests language for explicating it.

This line of reasoning raises deep philosophical issues. Although the structures of the cosmos certainly predate the human mind, they are not understood nor do they exist outside of human minds. As Bergin and Fisch (1984: xiv) have perceptively pointed out, in reference to the basic theory of human cognition expounded by Neapolitan philosopher Giambattista Vico, human beings "have themselves made this world of nations, but it was not without drafting, it was even without seeing the plan that they did just what the plan called for". As Peirce (volume 6, 1931–1958: 478) similarly put it, the human mind has "a natural bent in accordance with nature" (CP 6.478). This blending of mind and nature through visual iconicity becomes perception, which Peirce called the "outward clash" of the physical world on the senses.

Reasoning in mathematics does, of course, entail the use of information obtained through other media, including linguistic sentences. However, as neuroscientific research has shown rather convincingly, mental imagery and its expression in diagrammatic form is a more fundamental form of cognition, probably predating the advent of vocal language in carrying out counting and measurement tasks (Cummins 1996; Chandrasekaran et al. 1995). Even sentences, as Peirce often argued, hide within their logical structure a visual form of understanding that can be easily rendered diagrammatically.

Diagrams are, at one level, economical iconic forms. But, in so being, they show relations that are not apparent in linguistic or in other symbolic forms (Barwise & Etchemendy 1994, Allwein & Barwise 1996). As Radford (2010: 4) puts it, they present information to us by means of “ways of appearance”. They constitute a veritable explanatory system of logic of their own. Diagrams are inferences (informed guesses) that translate hunches (raw guesses) visually. These then lead to abductions (insights). The process of cognition is complete after the ideas produced in this way are organized logically (deduction). In fact, this suggests a model of cognition:



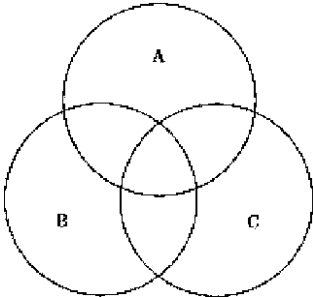
Hunches are the brain’s attempts to understand what something means initially. These lead to inferences through a consideration of what these attempts suggest in terms of previous knowledge. So, the Pythagorean triangle leads to the previously-hidden concept of number triples. Eventually, this concept lead to a hypothesis, namely that only when $n=2$ does the generalized Pythagorean formula hold ($c^n = a^n + b^n$) – called Fermat’s Last Theorem. This, in turn, led to many discoveries. It also led to a conclusive proof, which came, of course with the Taylor & Wiles (1995) proof. This seems to happen throughout the domain of mathematical discovery (Danesi 2013).

To grasp how diagrams are used in mathematics to show concepts that cannot be shown in other ways, consider imaginary numbers, which were discovered serendipitously. At first, it was not clear how they fit into the number system or how they could be represented on the Cartesian plane. This conundrum led to the ingenious invention of a diagram, called the Argand diagram that made it possible to show the relation of imaginary numbers to real ones. The diagram locates imaginary numbers (Im) on one axis and real ones (Re) on the other. The point $z = x + iy$ represents a complex number in the plane (called the Argand plane) and shows its vectorial features in terms of the angle θ that it forms. This is a geometric interpretation of complex numbers building on the previous diagrammatic system of Cartesian representation. The Argand plane allows for a visual interpretation of complex numbers. It shows that they can be added like vectors and can be multiplied in terms of polar coordinates with the product of the two moduli (absolute values). The angle of the product is the sum of the two angles. Multiplication by a complex number of modulus 1 is a rotation – a discovery that has been incorporated into the theory of complex

numbers. The invention of the Argand diagram turned out, therefore, to be not only a heuristic device, showing how addition, multiplication, and other operations of the complex numbers can be carried out systematically, but also a source of investigation of the structure of these numbers, having led to many discoveries in number theory.

Diagrams in Logic

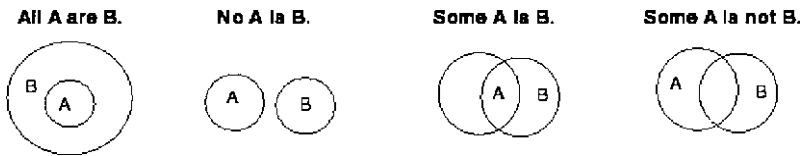
Peirce saw his EGs as more powerful models of logic than sentential (syllogistic) forms of logical representation. In fact, the whole field of set theory is fundamentally diagrammatic. In fact, Venn diagrams (1880; 1881) are indispensable for deducing logical implications, since they allude to various features of sets by their simple configuration. The principle of the Venn diagram is to show relationships among sets and elements in them. For example in the diagram below the intersection of three sets, A, B, C shows what elements (intersecting areas) are common to the three, to two of them together, and which are exclusive to a set:



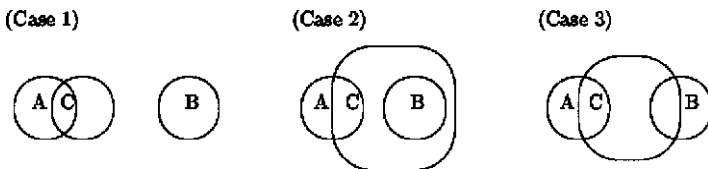
Diagrams permeate set theory, perhaps because they reveal intrinsic *image schemata* in cognition – an idea coming from the work of George Lakoff and his research associates (Lakoff & Johnson 1980, 1999; Lakoff 1987; Johnson 1987; Lakoff and Núñez 2000). These are defined as largely unconscious mental outlines of recurrent shapes, actions, dimensions, and so on that derive from perception and sensation. The world is made up of different kinds and levels of physical energy. Our knowledge of the world is filtered by our sense organs, which react to these energies. The patterns of energies become objects, events, people, and other aspects of the world through semiotic classification. However, some perceptions are not categorized because we lack the appropriate knowledge schemata

to interpret them. But by actually drawing our intuitive or instinctual images in diagram form, we gain direct access to their hidden structure. In a word, diagrams are the externalizations of image schemata. They not only mirror other kinds of stored information, such as sentential information, they also bring out the unconscious image schemata inherent in it (up-versus-down, containment-versus-openness, and so on). In so doing, they excise irrelevant detail from incoming information leaving only the relevant features in it in schema form.

The translation of sentential logic to diagram logic started with Euler. Before the advent of Venn diagrams, Euler represented categorical sentences in terms of diagrams that prefigure the Venn ones (Hammer and Shin 1996, 1998):

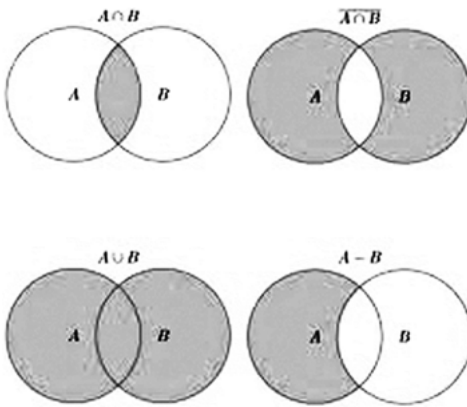


These are, in effect, the image schemata inherent in the categorical sentences, represented by circles. It actually does not matter whether the outline schema chosen is the circle – it could be squares, rectangles, or freely-drawn non-rigid forms – it is the visualized diagram of the sentential logic that cuts across language (and languages) and allows us to see the logical structure involved in bare outline form. The power of the diagrams over the linguistic forms lies in the fact that no additional conventions, paraphrases, or elaborations are needed – the relationships holding among sets are shown by means of the same relationships holding among the circles representing them. Euler was aware, however, of both the strengths and weaknesses of his diagrammatic system. For instance, in the statement: “No A is B. Some C is A. Therefore, Some C is not B”, no single diagram can represent the two premises, because the relationship between sets B and C cannot be fully specified in one single diagram. Instead, Euler suggested three possible cases:

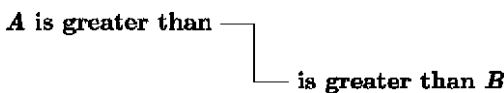


He claimed that the proposition “Some C is not B” can be read from all these diagrams. But it is far from clear how this is so. Such anomalies have led some

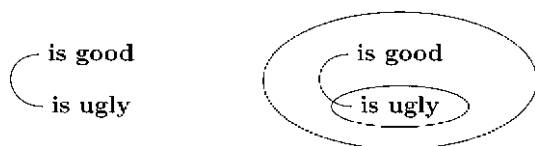
logicians to claim that diagrams are only ancillary devices, being ultimately incapable of representing all logical statements accurately. It was Venn (1881: 510) who tackled Euler's dilemma pointing out that the weakness lay in the fact that Euler's method did not show that imperfect knowledge exists. He called his method too "strict" in this regard. Venn aimed to overcome the weaknesses of Euler's diagrams by showing how partial information can be diagrammatized. So, a diagram like the one above of three intersecting sets, A, B, C (which he called primary) does not convey specific information about the relationship between sets. So, for instance, the relations between two sets, A and B, can be shown as follows, by simply shading them (Venn 1881: 122). With this simple modification, we can draw diagrams for various premises and relations:



However, it was Peirce who pointed out that Venn's system had no way of representing existential statements, disjunctive information, probabilities, and relations. Peirce aimed to extend Venn's system. He showed that "All A are B or some A is B" cannot be represented by neither the Euler or Venn systems in a single diagram. Like Euler, Peirce saw a graph as anything having its parts in relation to each other in such a way that they resemble relations among the parts of some different set of entities or referents. The relation was evident in the outline of the graph and thus showed in bare form how the thought process unfolded. A simple illustration of the underlying principles of Existential Graph Theory is the graph below, which Peirce used in place of $A > B$, to show the relation much more iconically than this symbolical form:



The line is called a line of identity by Peirce. In any EG any line of identity whose outermost part is evenly enclosed refers to something, and any one whose outermost part is oddly enclosed refers to anything there may be (CP 4.458). The following graph shows, essentially, how any EG can be used to represent logical statements (from Roberts 2009):



The first graph (where the outermost part of the line is evenly, zero, enclosed) says that something good is ugly, and the second graph (where the outermost part is enclosed once) says that everything good is ugly. The visual power of such a graph requires no comment (literally).

Concluding Remarks

The quote on which this brief article is based is a crucial one in understanding how discovery occurs in mathematics. As mentioned, Peirce attached extreme importance to the task of making diagrams practicable and practical. Graphs display not a linear succession of logical deductions, but how abduction unfolds, thus conveying information and simultaneously explaining how it is being done (CP 4. 619). Needless to say, this line of argumentation raises many deep questions about the nature of reality, the brain's connection to it, semiosis, and the nature of knowledge. But it is in raising these questions that the power of Peircean semiotics and philosophy lies.

As is well known, in 1931 Kurt Gödel showed that there never can be a consistent system of statements that can capture all the truths of mathematics. He showed, in effect, that the makers of the statements could never extricate themselves from making them. Gödel made it obvious to mathematicians that mathematics was made by them, and that the exploration of "mathematical truth" would go on forever as long as humans were around. The final map of the mathematical realm will never be drawn. Like other products of the imagination, the world of mathematics lies within the minds of humans. In effect, all diagrams are theories of reality, evaluating it in their own particular ways. In other words, our knowledge systems can only give us partial glimpses of reality.

Bent Sørensen¹ & Torkild Thellefsen²
78 Peirce on Metaphor

Metaphysics has been said contemptuously to be a fabric of metaphors. But not only metaphysics, but logical and phaneroscopic concepts need to be clothed in such garments. For a pure idea without metaphor . . . is an onion without a peel. (EPII: 392, 1906).

Over at least the last thirty years, a great variety of theories and models have been offered to specify how metaphor is an important mode of conceptual representation, or simply and solely a cognitive mechanism. Or formulated differently: these studies have been interested in metaphor as an additive instrument of knowledge, not as an ornament or a poetical embellishment. Charles Peirce had no theory of metaphor and he provided only a few remarks concerning the topic (cf. Hausmann 1996; Haley 1988). However, it seems possible to argue that also to him the metaphor is fundamental to human thought hence bringing him in line with “a modern view of metaphor” (cf. Danaher 1998; Haley 1999). The above mentioned quote is taken from Peirce’s paper “The Basis of Pragmaticism in the Normative Sciences” (1906), which was his sixth attempt to write his third Monist paper. In this paper, Peirce returned to the proof of pragmaticism, where he understood the proof from the perspective of the question: “how does one philosophize?”. Of particular interest to us here is that not only did Peirce see metaphor as central within the process of (philosophical) concept formation, but he also pointed towards metaphor as a natural disposition of the mind “a pure idea without metaphor . . . is an onion without a peel”. (EPII: 392) Concerning the former, Peirce specifically advocated the following viewpoint in “Short Logic” (1883):

If a logician has to construct a language *de novo* – which he actually has almost to do – he would naturally say, I shall need prepositions to express the temporal relations . . . and I shall need prepositions to express . . . spatial relations, and I shall need prepositions to express motions . . . For the rest I can manage with metaphors. (CP 2.229, note 1).

In order to fulfill the Kantian requirement of locating objects in space, time, and motion (cf. Factor 1996: 229), all that a logician needs in order to construct a language from scratch is indexical representations – in form of prepositions – and the metaphor. To Peirce then, the metaphor is not just an added force, or rhetorical device, to (the philosophical) language, but rather, one of its constituent

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forms. In the programmatic article “Ethics of Terminology” Peirce furthermore stressed how “the woof and the warp of all thought is . . . symbols, and the life of thought . . . is the life inherent in symbols” (CP 2.220). And he continued later in the same article: “Every symbol is, in its origin, either an image of the idea signified, or a reminiscence of some individual occurrence, person or thing, connected with its meaning, or is a metaphor” (CP 2.222). Even though the metaphor is only one of three possible ways in which symbols can emanate, it occupies a prominent place among these – since it is only via the metaphor that the symbol can be endowed with new significance and meaning. None of the two other ways in which symbols can occur, i.e., by imagining and reminiscing, can provide such an important semeiotic effect, since both always rely on already-established semeiotic relations (cf. Hausmann 1996: 197). Hence, in a Peircean perspective, the metaphor can be regarded as a new way of using language, leading to new symbols and new ways of thinking, and thereby leading to novel insights when opening up to innovative interpretative possibilities. In an untitled and undated paper, Peirce noted whereof an important feature of the skilled thinker consists. In him, Peirce found: “a sort of intellectual music in his soul by which he recognizes and creates symmetries, parallels and other relationships of form” (MS: 620). According to Peirce, the metaphor is a semeiotic relation – a hypoicon – based on a parallelism: “those which represent the representative character of a representamen by representing a parallelism in something else are metaphors” (CP 2.227). Thus, by coupling the two above-mentioned quotes, we can again see an intimate connection between the metaphor and the processes of thought. As a matter of fact, Peirce himself often used metaphors in an active and self-controlled manner in his thinking, being well aware of their important cognitive and epistemic function. In an untitled manuscript (circa 1900) Peirce was working with “the problem of consciousness”, and he attributed a primary role to a metaphor in the semeiotic process:

We are going to shock the physiological psychologists, for once, by attempting, not an account of a hypothesis about the brain, but the description of an image which shall correspond, point by point, to the different features of the phenomenon of consciousness. Consciousness is like a bottomless lake . . . The aptness of this metaphor is very great”. (CP 7.553–54).

According to Peirce, there is a salient parallelism between the way ideas of the mind interact in relation to each other, and the way objects are floating in a bottomless lake; or “bottomless lake” can be a hypo-iconic representation of “consciousness”, because the representative character of this representamen, as a semeiotic object, is being represented by aid of a parallelism. We can interpret the metaphor as follows: “consciousness is a bottomless lake”, in which

ideas are floating in various depths. The water of the lake consists of ideas and the water is only renewed by the rain – the continuous bombardment of percepts that the mind is exposed to (Peirce agreed with the dictum of Aristotle “*Nihil est in intellectu quod non prius fuerit in sensu*”, cf. CP 5.181). If we are to investigate some ideas of the mind, then we must rely on our abilities to fixate these ideas near the surface, or there will be limitations concerning how deep we can go, because the water will become less clear the deeper we go. The “Consciousness-is-like-a-bottomless-lake” metaphor is an example of how Peirce regarded metaphor as an important vehicle through which new relations of parallelisms can be detected and communicated; or metaphor can have an instrumental value in the growth of reasoning, knowledge, and the development of perception. As he himself said: “the aptness of this metaphor is very great” (CP 7.553–54) – and therefore Peirce preferred to use this metaphor if he had to explain and communicate concerning different characteristics of consciousness instead of putting forth a physiological hypothesis of the brain (cf. Haley 1988). But if it is by virtue of the hypo-iconic metaphor that new knowledge can occur, it must, first and foremost, then, have an abductive nature (cf. Sørensen, Thellefsen & Moth 2007: 568–573) Admittedly, to our knowledge, Peirce never did analyze nor even mention the two concepts in the same context. However, one of Peirce’s descriptions regarding the formal structure of the abductive inference seems to precisely support the idea that metaphor follows this logical form (cf. Liszka 1996; Ponzio 2006). In a review of William James’ famous work “The Principles of Psychology” (1880), Peirce wrote the following:

A well-recognized kind of object, M, has for its ordinary predicates P [1], P [2], P [3], etc. indistinctly recognized. The suggesting object, S, has these same predicates P [1], P [2], P [3], etc. Hence, S is of the kind M. (CP 8.64).

By metaphor, then, we can guess abductively and look for a parallelism, and see that, from a certain perspective, a sign and an object do share a number of salient predicates: M represents the representative character of a representamen, an object S, by aid of a parallelism – hence, S is of the same kind as M. The abductive metaphor suggests that something may be the case; not that it is; the abductive metaphor is related to originality; the originality consists in seeing the object, phenomena, may be a member of a known class, it is an act of possible insight. As Peirce remarked in a manuscript concerning the abductive act:

The truth is that the whole fabric of our knowledge is one matted felt of pure hypothesis that is confirmed or refined by induction. Not the smallest advance in knowledge can be made beyond the stage of vacant starrng, without making an abduction at every step. (MS: 692).

Of course, not every abductive inference leads to the creation of a metaphor, nor is every abduction truly creative and innovative. However, sometimes a new semeiosis enters the world, and we will suggest that, to Peirce, it can be a matter of metaphoricity, which shows itself to be useful in the identification or creation of new parallisms, enhancing the processes of understanding, interpretation, and innovation. From this perspective, Peirce seems fully in line with “a modern view of metaphor”.

Priscila Borges¹

79 Peirce's System of 66 Classes of Signs

On these considerations I base a recognition of ten respects in which Signs may be divided.

I do not say that these divisions are enough. But since every one of them turns to be a trichotomy, it follows that in order to decide what classes of signs result from them, I have 3¹⁰, or 59049, difficult questions to carefully consider; and therefore I will not undertake to carry my systematical division of signs any further, but will leave that for future explorers.

(EPII: 482, 1908).

The quotation above can be found in Peirce's letter draft to Lady Welby from 24–28 December 1908. Their correspondence is a great source of research to semiotics and is fundamental for understanding Peirce's late proposal on the classes of signs. The correspondence between Peirce and L. Welby lasted from June 1903 to August 1911, the last years of their lives. During this period, Peirce was working on his book of logic and on the theory of signs. In 1903, L. Welby published her book *What is meaning? Studies in the Development of Significance*, which means that both were interested in signifying and representation.

Although the theory of signs is usually associated to the classes of signs, it is important to remark that the classification of signs is just part of Peirce's semiotics, which is divided in three branches: Speculative Grammar, Logical Critic and Speculative Rhetoric or Methodeutic. The first branch, Speculative Grammar, "investigates representation relations (signs), seeks to work on necessary and sufficient conditions for representing, and classifies the different possible kinds of representation" (EPI: xxxviii). The quotation above is not only about semiotics, but also draws attention to a problem that concerns Speculative Grammar.

Peirce's systems of sign classes vary from three to sixty-six classes. The most known system describes ten classes, which were well explained and exemplified by Peirce in his texts and are a frequent topic among Peirce's commentators. In contrast, the system of sixty-six classes was merely suggested by Peirce in letters to Lady Welby in the late years of his life. In this letters, he showed logically how to reach the sixty-six classes from ten trichotomies, but he could not elaborate on the definitions and details of them, leaving the subject for further researches (EPII: 482). Left open, this topic is still underexplored and full of divergence among few researchers (Weiss & Burks 1945; Sanders 1970; Müller 1994; Farias & Queiroz 2003, 2004, 2006; Merkle 2001; Romanini 2006; Borges 2010).

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One of the first steps on the development of this subject concerns the identification of the classes. Peirce, however, makes just a few allusions as to the ten trichotomies, without analyzing them or taking into account their relation. In different letters, Peirce presents the ten trichotomies in more than one order, which tends to cause some confusion (Sanders 1970; Merkle 2001; Farias & Queiroz, 2003). Until now, there is no agreement about the dependence and order of the trichotomies, which is a main issue among researchers².

I think Peirce's own text gives us a clue on how to solve this problem. Right after proposing the ten trichotomies, Peirce proceeds with an analysis showing that the order of the trichotomies and the relation of the phenomenological categories are fundamental for defining the classes of signs. His account on the relation between the immediate object and the ground of the sign is of great importance to define the order of the trichotomies. Therefore, I will focus on the analyses he makes to suggest an order for the trichotomies.

He starts by affirming that "it is evident that an Actisign³, or one that belongs to the Universe of Experience, which Brutely acts on the person, can also be a Denominative⁴, that is, that its Immediate Object is represented as belonging to the same Universe" (EPII: 485–6). A pointing finger is an example of this kind of sign.

Peirce goes on explaining: "We fully expect to find that a Potisign⁵ can be Descriptive⁶ and that a Famisign⁷ can be Copulant"⁸ (ibid.). A geometrical dia-

2 Weiss and Burks (1945) adopted the order [S] [IO] [DO] [II] [DI] [FI] [S-DO] [S-DI] [S-FI] [FI-S-O], presenting first the nature of each term, starting with the nature of the sign itself, and then considering the relations among terms. Sanders (1970) pointed out that Weiss and Burks neglected the rules of dependence between the trichotomies in this work and showed that Johnson, noticing that this order could not be corrected, proposed the following [S] [S-DO] [II] [DO] [IO] [S-FI] [S-DI] [DI] [FI] [FI-S-O]. Sanders affirms that (1970:11) "none of the above is correct", though he does not clearly suggest an order for the trichotomies. Müller (1994) establishes the following order [DO] [IO] [S] [FI] [DI] [II] [S-DO] [S-FI] [S-DI] [FI-S-O]. Merkle (2001) and Farias and Queiroz (2003, 2006) have worked on visual models that allow the comparison and discussion about the order of the trichotomies. Their models show that the adoption of one or other order has great impact on the system of sixty-six classes, but none of them proposes an answer to this question. A further discussion on the sixty-six classes of signs is made by Romanini (2006), and claims that the system should have eleven and not ten main trichotomies in the following order: [IO] [II] [S] [DO] [DI] [FI] [S-DO] [S-DI] [S-FI] [S-DO-DI] [S-DO-FI]. I adopted the logical order [DO] [IO] [S] [S-DO] [II] [DI] [FI] [S-FI] [S-DI] [FI-S-O] and experimented with it in a few semiotic analyses (Borges, 2010).

3 Referring to the second mode of Presentation of the Sign [S], or Sinsign.

4 Referring to the second mode of Presentation of the Immediate Object [IO], or Designative.

5 Referring to the first mode of Presentation of the Sign [S], or Qualisign.

6 Referring to the first mode of Presentation of the Immediate Object [IO].

7 Referring to the third mode of Presentation of the Sign [S], or Legisign.

8 Referring to the third mode of Presentation of the Immediate Object [IO], or Distributive.

gram is a Descriptive Qualisign insofar as it is a mere possibility of a mental image without any really existing representation, but to exist, a diagram must be embodied. If the diagram is a Qualisign, it is only a vague idea, which has not the precision of a geometrical surface that allows the existence of material bodies. Qualisigns are, then, Descriptive signs (EPII: 486–7).

Then, Peirce says that the expression of a universally necessary sequence of the type “if ____, then ____” is a Legisign and a Copulative, because they “express a universal sequence” (EPII: 487) that can be applied to an infinite number of specific cases.

After this, Peirce doubts whether a Potisign (Qualisign) can be Copulative or whether a Famisign (Legisign) can be Descriptive (*ibid.*). Peirce explains that a Qualisign can be Copulative saying: “Given any four rays in space; then either there can be only two rays, at most, that cut them all, or there can be any number” (*ibid.*). As a general statement of a geometrical law, the proposition is the representation of a Legisign. For the law, to be true or not is irrelevant as long as the four rays really exist anywhere. Since the law expresses the mere possibility of the existence of such rays, it can be considered a Qualisign. As the expression of a universal sequence, it is a Copulative. An individual representation of the law thus expressed in the form of a graphic representation makes it a Sinsign. Consequently, a Copulative can be a Qualisign, a Sinsign and a Legisign, indicating that the Immediate Object precedes the Sign.

Peirce goes on discussing the restrictions of combining trichotomies due to the categorical rules of determination. The basis of these restrictions is the law of causation, which states that if there is a relation between two terms in which one is antecedent and the other is its consequent, then the antecedent is always determined and fixed in relation to the consequent, and the consequent remains undetermined in relation to its antecedent (EPII: 305). Hence, the analysis should not start from the consequent element, the sign itself, but always from the antecedent, the immediate object that determines the sign.

The first restriction is that a Legisign cannot be a Descriptive (EPII: 487), despite the fact that a description can be expressed in words.

“The proper way to pursue the inquiry is to start from the definition already given of the triadic relation of Sign-Object-Interpretant. We thus learn that the Object determines (i.e., renders definitely to be such as it will be,) the Sign in a particular manner. Now it is of the essence of the Sign to determine certain Ideas, i.e., certain Possibles; and it is the essence of any Tendency to determine Occurrences” (*ibid.*).

It is of the nature of a sign to represent an object, and this nature requires a law, some power to determine this representation. Thus, only the possibility of a fact or the possibility of an idea is not enough to trigger the process of

representation. A sign as an idea or an occurrence can only represent an object if something that preceded it has exerted a determination on it. If the immediate object precedes the sign and if the determining power is a kind of law, the immediate object must then be a Copulative. A Copulative sign is the sign capable of guiding or having a tendency to entail, according to a certain rule, a certain determination upon some sign. The Copulative, being of the nature of a third, is capable of determining Qualisigns, Sinsigns and Legisigns.

Nevertheless, no individual occurrence or set of occurrences can determine any tendency or habit. Occurrences are singular facts in their given presence, and a tendency consists in an *esse in futuro* of something, a coming-to-be. Singular facts thus cannot determine anything in the future. For example, if psychological habits are being reinforced by actions that precede them, these habits are not only formed because of actions alone, but because there is a specific tendency that these former actions be actualized with an increasing frequency. Hence, a Denominative immediate object, which is an actual occurrence, cannot determine a Legisign, which is a sign of the category of thirdness, law, or habit (ibid.).

If there is an actual occurrence, it is clearly possible to think about it or to have a vague idea of its characteristics. Thus, a Denominative immediate object can certainly determine a Qualisign. However, a Descriptive [IO] cannot determine a Legisign because this kind of object is too undetermined to bring about a sign of law. An example is the proposition: “no number of Descriptive propositions of the type ‘Some S is P’ can ever determine the truth of a Copulative Proposition ‘Any S is P’” (ibid.). Just as a Descriptive [IO] cannot determine an actual sign, so a Descriptive cannot give rise to Sinsigns either (ibid.).

There are two restrictions on the possibility of combining the dynamical object with its immediate object (CP 8.367). First, if the dynamical object is a mere possibility, the immediate object can only be of the same kind, that is, Descriptive. Secondly, when the immediate object is Copulative, the dynamical object must also be of thirdness, or Collective. In light of these two restrictions, Peirce introduces his concepts of Abstractives and Collectives:

I was of the opinion that if the Dynamical Object be a mere Possible the Immediate Object could only be of the same nature, while if the Immediate Object were a Tendency or Habit then the Dynamical Object must be of the same nature. Consequently an Abstractive [DO] must be a Mark [S], while a Type [S] must be a Collective [DO], which shows how I conceived Abstractives and Collectives.⁹ (EPII: 489).

⁹ Brackets are insertions of mine.

Knowing that the immediate object is the object as the sign represents it and that the dynamical object determines the sign, we may suppose logically that the dynamical object is before the sign and its immediate object, since it could not determine something that precedes it. Thus, a determining relation goes from the object to the sign. Consequently, the first trichotomy to be considered might be the dynamical object, the second, the immediate object, and the third, the ground of the sign. Peirce's demonstration (EPII: 483–491) shows that the ten trichotomies he presented earlier in this same letter (EPII: 482–3) are not in logical order, since we first find the ground of the sign and then the immediate object followed by the dynamical object. If we pay attention to the verbs Peirce uses to present these trichotomies, we can suppose that he was thinking about the experience with the sign and not about its logical order when he wrote them. He refers to the mode of *Apprehension* of the sign, the mode of *Presentation* of the immediate object and the mode of *Being* of the dynamical object. When he starts examining the trichotomy dependence, it is the logic of the relations that rules it and not the mode of *Apprehension*.

Hence, I suggest that since the object determines the sign and not vice-versa, it is necessary to start with the dynamical object, followed by the immediate object and the ground of the sign. After the first three correlates follows the first relation between the sign and its dynamical object. The dynamical object can then be shown to determine its possible interpretants, called immediate interpretants, which, in turn, become dynamical interpretants, provided they are existents. Then, there is the second relation between the sign and its dynamical interpretant. Moreover, it is now possible to represent the idea of infinite semiosis as the tendency of the dynamical interpretant to develop towards a final interpretant. All correlates and dyadic relations being represented, it is possible to recognize the triadic relation constituted by the sign, its dynamical object and its final interpretant.

The analysis Peirce made on the relation of the immediate object to the ground of the sign is a good example of how future investigations can carry on his theory. Analyzing the relation between each pair of trichotomies is the first step to demonstrate their dependence. There are still eight relations between trichotomies to be analyzed in order to attest the order of the ten trichotomies. This is fundamental to carry on Peirce's systems of classes of signs.

Once the dependence of the trichotomies is defined, it will not be necessary to consider 59049 difficult questions. Since most of these classes will be discarded as impossible ones, we will reach a system of 66 classes of signs. Still, it is not an easy task, but it is more encouraging to consider 66 classes of signs, each one composed of ten aspects (resulting in about 660 aspects), than to take into account 59049 aspects. Some people argue that there is no need for such a

complex system of classes of signs; the ten-fold classes should be enough for semiotic analysis. This argument ignores that the research on the system of 66 classes of signs can reveal basic principles for semiotics. No discipline should stop their just because someone claims there is no need for them in practice. No mathematician should stop developing mathematics just because there is no physicist capable of using it. If the system of 66 classes of signs is not necessary for most of the regular semiotic applications, it is extremely important to show that the classes of signs are a complex system of related classes that should never be considered as isolated categories (as we see more often than we should on semiotic analysis). A more complex system has the potential to better show the dependence, the relation and the continuity among the classes of signs; and that could lead to a cardinal change on the understanding of semiotics and on the analysis using any system of sign classes.

Charles G. Conway¹

80 Peirce's Philosophical Theology, Continuity, and Communication with the Deity

Enter your skiff of Musement, push off into the lake of thought, and leave the breath of heaven to swell your sail. With your eyes open, awake to what is about or within you, and open conversation with yourself; for such is all meditation. (CP 6.461, 1908).

This derives from Peirce's "A Neglected Argument for the Reality of God" (NARG) (CP 6.452–91) and so conveys a religious temper. Nevertheless, it requires not only philosophical analysis but an interpretation of the figurative language Peirce employs.² I focus on this quotation first before exploring his other religious views and theology which I show are central to his body of thought, employing his doctrine of continuity. I conclude with an overview of the five stages through which Peircean commentary has evolved in the project of knitting together and evaluating Peirce's somewhat scattered treatments of religion and theology.

I shall not analyze the validity or soundness of NARG, but treat it here basically as the context for our quotation.³

Initially, we should recall that 'musement' is a variety of disinterested pure play that comes to focus, without intentional direction, on the order and structure of our tri-categorical universe, but remains general, not narrowing to the discipline of any special science. It has no rules except liberty and it "bloweth where it listeth"⁴ (CP 6.458). Peirce insists that this contemplative state will "inevitably suggest the hypothesis of God's Reality" (CP 6.465). Now I turn to our quotation proper to construe its key words and phrases:

- *Enter* and *push off* indicates this will be a single-handed cruise self-consciously begun, not drifted into by way of reverie.
- *Musement* passes quickly because pursued "in odd half-hours" (CP 6.459).

1 Independent Scholar.

2 Multiple possible interpretation of evocative poetic language should be here constrained by Peirce's underlying philosophical intent.

3 I have earlier postulated that, overall, NARG is an olio of religion and theology, truncated at the abductive stage, that amounts to a report of a religio-esthetic experience. (Conway 2008: 289–311).

4 The quoted words come from John 3:8, where the evangelist uses wind as a symbol for the Spirit.

- *Your* suggests that the person addressed has a possessory interest in the craft, thereby affirming that it may be operated repeatedly and at will.
- *Skiff* is a small, light, open, shallow-draft boat meant for short-term usage close to shore and particularly subject to the influence of wind, wave, and weather. That it may be oarless further contributes to a sense of passivity. Nevertheless, it is not rudderless and a skilled sailor may manipulate the sail(s) to modify speed and direction. Meanwhile, the land symbolizing the hurly-burly of quotidian existence remains not far off.
- *Lake of thought* may initially suggest a relatively static environment. However, a lake is an aneurysm in a stream, continuously being fed at one end and drained at another.⁵ This mirrors not only the development of cognition but could represent more generally Peirce’s semiotic doctrine of an infinite series of signs and even his cosmological stance on an evolutionary continuum. The depths arguably symbolize the unconscious because Peirce explicitly conceives “of unconsciousness as a bottomless lake, whose waters seem transparent, yet into which we can clearly see but a little way” (CP 7.547).
- *Leave* translates as do not impede. This evokes a perennial dispute among theologians, whether grace is resistible. Some Christian theologians contend that unmerited but freely given divine help overcomes any human resistance to the call. Others maintain that human free will permits the rejection of even so potent a gift.
- *Breath of heaven* resounds as a reference to the divine spirit foreshadowed by “bloweth”.⁶ Such an intimation would not be out of character for a trinitarian Christian such as Peirce. This interpretation may be reinforced with “what is about or within you” because Tillich designates the abiding Spirit in just this fashion⁷ (Tillich 1963, 108). Further, in Greek *pneuma* is breath and this supplies the root for the theological study of the Holy Spirit, pneumatology.
- *Swell your sail* alludes to empowerment by grace, i.e., divine inspiration energizes this undertaking.

⁵ Perhaps Peirce adopted the notion of a “stream of consciousness” from his friend, William James.

⁶ “Breath” is a metaphor for spirit in both Testaments of the Bible. Two examples: at Genesis 2.7 God breathes into the nostrils of Adam; at John 26.22 Jesus breathes on the disciples and says, “Receive the Holy Spirit”.

⁷ Traditionally, a mission of the Holy Spirit has been the illumination of the believer both as to scripture and experience of the divine as well as serving as a guide for spiritual development and a communicative link with the Godhead for grace and love.

- *Eyes open* portrays a relaxed attentiveness. It recalls Peirce's use of "open your eyes" when describing a direct experience of God (CP 6.493).
- *Awake to what is about or within you* entwines two threads of Peirce's thinking, epistemological and ontological. The first concerns his dichotomy of immediate and dynamical objects. The immediate object is a mental representation of a reactive sign produced in the encounter with an individual object, thus part of the already-commenced semiotic process. The dynamical object is extra-semiotic and is the object in the world whose existence may be inferred, but not constituted by that act of inference. It is that towards which thought converges.⁸

The second thread involves the 'phaneron', which Peirce defines as "the collective total of all that is in any way or in any sense present to the mind, quite regardless of whether it corresponds to any real thing or not" (CP 1.284).

- *Open conversation with yourself* raises multiple issues. First, Peirce declares that an individual's "thoughts are what he is 'saying to himself', that is, is saying to that other self that is just coming into life in the flow of time" (CP 5.421). As he puts it later, "One is virtually a . . . somewhat different person, to whom one's present thought has to be communicated" (CP 7.103). Philosophically, one discerns the continuity of moments of time (MS 313) and the adumbration of his concept of 'personality' as a coordination of ideas (CP 6.155). For a poetical perspective, Wallace Stevens depicts such interior dialogue: "We feel the obscurity of an order, a whole, knowledge, that which arranged the rendezvous" (Stevens 1982, 524). In few words Stevens captures fortuitously the key elements of NARG, i.e., an ordered universe and God who created it, both of which humans experience.
- *Such is all meditation* accentuates that musement triggers all reflective thought whatever the subject matter and thus is the *ursprung* of all cognition (CP 6.488). The quasi-continuous set of Peirce's normative sciences⁹, anchored in the esthetics that musement initiates, then superintends the progression from feelings to the crown of our rationality, conceptual thinking.

Hookway seems correct that Peirce brings to NARG personal and metaphysical commitments including a belief in "the reality of the God of Christian tradition" (Hookway 2000: 284). If so, we may legitimately ask whether the fruits of musement might graduate to a type of 'revelation'. One could mount a *prima facie*

⁸ Ochs interprets 'musement' as a "symbol whose immediate object is God's presence in the mind and whose dynamical object is God's purpose in the universe" (Ochs 1998: 351 n118).

⁹ These are three: *esthetics* – discerns the admirable; *ethics* – determines proper ends; *logic* – charts the attainment of truth by right reasoning (CP 5.120–50). They "form one distinctly marked whole" wherein exact disjunctions are incidental (MS 283).

case for this because Peirce posits that a sense of the divine may arise in three ways: one's inward development, God's speaking, or seeing it about us (CP 1.108). Musement yields the third, at least, and may result from the second, and contribute to the first.

Peirce's reference to John's Gospel recalls that he draws on this same scripture in order to derive the agapasm that facilitates a harmonization of chance and necessity in the universe. Such reliance is so remarkable that he asserts that "the statement of St. John is the formula of an evolutionary philosophy"¹⁰ (6.289). Patently, at least in his cosmology, a marriage of faith and reason, the essence of philosophical theology, occurs in Peirce's thought.

Additionally, there are recurrent instances where he descants on issues of God and religion. I will not sift these now, but cite the topics and locations of many.¹¹

Religion and Theology

Peirce consistently affirms that religious belief is a matter of instinct (CP 6.500). No "genuine religion could come from the head instead of the heart" (CP 1.665). "Where would such an idea, say that of God, come from, if not from direct experience? . . . as to God, open your eyes – and your heart, which is also a perceptive organ – and you will see him" (CP 6.493).

What lies behind this stance is that while science leads us to the truth in the long-run, humans exist only in the short-run. Thus, the existence or not of God is vitally important, therefore instinct appears the more reliable guide here. Not so for theology.

Theology is a second order reflection on religious experience, scripture, and tradition. Peirce realizes that "religion is founded in experience, meditations and direct perception but that experience needs to be properly interpreted and dialectically developed" (Smith 1978: 182). We are rational beings, thus connaturally faith seeks understanding.

10 This occasions his characterizing John as "ontological gosseller" (CP 6.289).

11 They include: (a) prayer – CP 6.162, CP 6.516, CP 6.104; (b) revelation – CP 1.143, CP 1.108; (c) miracles – MSS 690, 692, 869–73; (d) mysticism – CP 6.425; (e) afterlife – CP 6.519; (f) ecclesiology – CP 6.427, CP 6.443, CP 6.451; (g) final causes as religious – CP 6.434; (h) religion and science – CP 6.216, CP 6.426; (i) eschatological vision – CP 1.673, CP 5.119, CP 5.402; (j) theology – CP 6.3, CP 6.438, CP 6.466; (k) theological virtues – EPI:150; (l) God-ordained task of humans – CP 5.403.

However, the discipline of theology is no longer sentiment and so must proceed in a fashion analogous to science and even adopt its method and spirit of inquiry (CP 6.428). Smith maintains that we see evidence of a “point of contact between the movement of the mind in religious meditation and the creative ingenuity of human thought in the domain of science” (Smith 1981, 497) in the abductive activity of musement that we recognize here as the initial stage of the generation of NARG. Recall that our quotation speaks of “all meditation”. Further, Anderson reminds us that “science, (Peirce) maintained, always functions in the company of metaphysical beliefs. It is in this spirit that he offered his agapistic cosmology” (Anderson 1995: 111).

Continuity and Communication with the Deity

Peirce's notion of continuity has been treated extensively elsewhere, so I move directly to how it impacts the human person's ability to communicate with God. In “the Law of Mind” (CP 6.102–63), Peirce asserts that ideas, which originate in feelings, spread continuously and merge into more general ideas. Collections of ideas are what actually constitute ‘personalities’ (CP 6.155). Eventually the ideas will aggregate “in the mind of some vast consciousness, who . . . is a Deity relatively to us” (MS 309). Therefore, reasons Peirce, the universal mind containing all ideas in one overarching idea is by anthropomorphic analogy a ‘person’, capable of disseminating ideas and entertaining the utterances of creatures.

Consequently, Peirce declares that his doctrine of continuity (synechism) must “admit that if there is a personal God, we must have a direct perception of that person and indeed be in personal communication with him” (CP 6.162). This further evidence supports the criticality of philosophical theology for Peirce.

Evolution of Opinion Regarding the Role of Peirce's Philosophical Theology

Orange propounds that “Peirce was right in believing his religious beliefs integral to his whole scientific philosophy” (Orange 1984: 89).

Raposa, in the *locus classicus* for the analysis of Peirce's religious thought, insists that “‘philosophical theology’ . . . is actually exemplified in some of his writings” (Raposa 1989: 155, n4). Additionally, he declares that “Peirce's philosophy seems to have been shaped and informed by certain religious beliefs and

ideas ... supplying an illuminating perspective on the whole of it” (Raposa 1989: 4, 6).

Corrington also maintains that Peirce was engaged in philosophical theology although “not a gifted philosophical theologian” (Corrington 1995: 173).

I rest my case with Ochs’ resounding affirmation that “Peirce’s philosophical theology was an integral, perhaps central, element of his philosophical enterprise” (Ochs 1992: 59).

However, such conclusion was not arrived at immediately. As one investigates the history of commentary on Peirce’s religious thought, a striking metamorphosis discloses itself. At first, scholars were puzzled by what appeared an appendage out-of-joint with the Peircean corpus. The editors for volume six of Peirce’s *Collected Papers* take the perspective in 1935 that this volume, “devoted to religion or ‘psychical metaphysics,’ has rather tenuous connections with the rest of the system, offering ... views which have a sociological or biographical, rather than a fundamental systematic interest” (CP 6.v).

This view continued to dominate into the 1950s. Goudge expresses sympathy “with Morris Cohen’s judgment, when he said of Peirce’s speculative philosophy: ‘I cannot in my imagination see how the various lines of this thought can be made to meet’” (Goudge 1950: 325).

Opinion began to shift with an article by John E. Smith, “Religion and Theology in Peirce” (Smith 1952: 251–67). Interest in this issue grew during the 1960s and 1970s as articles by recognized scholars appeared sporadically in journals. However, it was not until the 1980s that two books on Peirce’s religious stances by Orange and Raposa appeared. Ochs’ book followed a decade later. During the 1990s and thereafter articles have proliferated as a perusal of the literature will disclose. The evolution of scholarly opinion has traced five stages:

1. Religion is not part of Peirce’s system.¹²
2. Religion is an idiosyncratic appendage to his system.
3. Peirce’s religious thought is not at variance with his philosophy.
4. Religion is a part of his philosophical system.
5. A philosophical theology is at the core of Peirce’s system.

Of course, this essay is part of the fifth stage. Philosophical theology by definition requires a marriage of faith and reason and Peirce explicitly argues for such in his cosmology. Further, his stances on multiple religious issues evince that he makes such linkage both in his philosophy and in his life.

As collateral evidence for this perspective, I point to the pragmatism he espoused in 1905 (5.411–63), which differs from pragmatism in that the former:

¹² ‘System’ applies loosely: Peirce’s architectonic thought lacks being plenary.

1. Considers thought as well as action as the consequence of a concept;
2. Considers the “rational purport”, or teleology, of thought and action;
3. Affirms the Absolute, in theological terms an *Ens necessarium*;
4. Accepts instinctual beliefs including the belief in God;
5. As a principle of logic, is grounded in ethics and esthetics so that the fruits of these enterprises are subsumed by it, and these include: a *summum bonum* of concrete reasonableness and a God-hypothesis developed from the esthetic activity of musement.

The salience of the chosen quotation reveals itself – it accentuates the criticality of musement, which triggers the abductive stage of, in this case, a theoretical reasoning about God. It is around this hypothesis that all the other utterances by Peirce about religion and theology can cluster and aggregate into the schema for a philosophical theology. Coming scholars, similarly disposed as Peirce, then may elaborate on the centrality of his philosophical theology and its ramifications.¹³

However, if philosophical theology is the heart of Peirce's philosophy, then continuity is its skeleton because it conjoins everything – the universe itself, our cognition of it and of God, our unity as a person, and the ability to transmit ideas and receive them from others. Therefore, continuity must ground and inform all our inquiries into cognition, semiotics, and communication because it sanctions the Thirdness¹⁴ of thought.¹⁵

13 NARG is an apt nucleus for such enterprise because, besides the main thrust of a God-hypothesis, it contains a potpourri of religious and philosophical themata, religion (CP 6.466–7), theology (CP 6.466, CP 6.457, CP 6.489), ontology (CP 6.462), metaphysics (CP 6.463), logic (CP 6.456, CP 6.470–5), pragmatism (CP 6.790), evolution (CP 6.465), cosmogony (CP 6.452, CP 6.490), semiotics (CP 6.471), psychology (CP 6.458), and science (CP 6.460, CP 6.488).

14 This universal category (thought, law, habit) mediates Peirce's other two: possibility (Firstness) and actuality (Secondness).

15 See e.g. CP 1.27; CP 1.337; CP 1.537; CP 4.1; CP 5.121; CP 5.314; CP 5.436; CP 5.470; CP 6.173; CP 6.307; CP 8.256–7.

Patrick J. Coppock¹

81 The Play of Musement

There is a certain agreeable occupation of mind which, from its having no distinctive name, I infer is not as commonly practiced as it deserves to be; for indulged in moderately – say through some five to six per cent of one’s waking time, perhaps during a stroll – it is refreshing enough more than to repay the expenditure. Because it involves no purpose save that of casting aside all serious purpose, I have sometimes been half-inclined to call it reverie with some qualification; but for a frame of mind so antipodal to vacancy and dreaminess such a designation would be too excruciating a misfit. In fact, it is Pure Play. Now, Play, we all know, is a lively exercise of one’s powers. Pure Play has no rules, except this very law of liberty. It bloweth where it listeth. It has no purpose, unless recreation. (CP 6.458, 1908).

As we can see in the citation above, in formulating his understandings of the notion of “the play of musement” in his oft considered controversial article “A Neglected Argument for the Reality of God” (hereafter NARG), Peirce elects not only to emphasize the sporadic, temporally limited character of the appearance of musement in our minds, and its “casting aside” of all serious purpose, he also hints at its potential utility, which he couches metaphorically in economic terms: “*it is refreshing enough more than to repay the expenditure*”.

From here, he moves on to emphasize Musement’s creative potential as a form of recreational intellectual stimulation, by framing it as “Pure Play”, which he characterizes as “*lively exercise of one’s powers*”, possessing “*no rules*”, apart from “*this very law of liberty*”. He then goes on, in a subsequent section of his NARG, to point out that though such playful activity inhabits only a quite specific, limited temporal space if seen in relation to structured communication of intellectual activities such as those associated with our long term collective pursuit of scientific truth, it may nonetheless be instrumental in pointing to, and activating, innovative concatenations of sense impressions that suggest new areas of focus for ongoing, or not yet begun, understandings, reflections, hypothesis development, analysis and debate, all typical aspects of scientific research practices and processes:

If one who had determined to make trial of Musement as a favorite recreation were to ask me for advice, I should reply as follows: The dawn and the gloaming most invite one to Musement; but I have found no watch of the nychthemeron that has not its own advantages for the pursuit. It begins passively enough with drinking in the impression of some nook in one of the three Universes. But impression soon passes into attentive observation, observation into musing, musing into a lively give and take of communion between self

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and self. If one's observations and reflections are allowed to specialize themselves too much, the Play will be converted into scientific study; and that cannot be pursued in odd half hours. (CP 6.459).

Three core notions mentioned by Peirce in the latter quote above correspond to experiential phases of the Play of Musement, and are of particular interest here: i) "impression", ii) "attentive observation", and iii) "the lively give and take of communion between self and self". Each of these three aspects of Musement can, in their turn, be seen as standing in an intimate conceptual relational framework with one of Peirce's three categories of being²: *Firstness*, *Secondness* and *Thirdness*.

Firstness, for example, has to do with qualities of feeling, possibility, vagueness, and reference to an abstract "ground", which meshes well with the notion of "impression" mentioned by Peirce above. *Secondness*, having to do with reaction, relation, actuality, discreteness and reference to some specific correlate, can easily be associated with the notion of "attentive observation", while *Thirdness*, having to do with representation, mediation, laws, generality and reference to an interpretant in some sociocultural meaning sphere, blends well with the notion of a "lively give and take of communion between self and self". This latter description can in itself be seen as a model for – or a simulation of – animated interactions and discussions with others. Lively interactions of this kind, of course, lie at the core of all forms of cultural semiosis, and facilitate the shared construction and management of processes of structured meaning development and exchange, which typically characterize practices in the cultural sphere of science: observation, reasoning, hypothesis development and debate.

The Play of Musement is seen by Peirce as a sort of intermediary "ludic interface" – a playful, dreamlike preparatory phase opening up for inspirational "cherry picking" within the sphere of the pure vagueness of *Firstness*. This facilitates movement over to the narrowly focused immediacy of *Secondness*, and then on to open-minded involvement in critical dialogical speculation and logical reasoning together with others. This, in its turn, fosters the emergence, diffusion and development of precisely described, logically consolidated, consensually agreeable upon, *generalized understandings of real phenomena*, which are conceived of by Peirce in terms of *Thirdness*. More generally speaking, then, Musement can be seen as kind of initial "door-opener" to engagement in speculative socio-culturally regulated meaning enrichment processes, which are fundamental for the more long term hypothesis generation, logical reasoning and knowledge refinement practices that characterize our myriad international scientific communities.

² [http://en.wikipedia.org/wiki/Categories_\(Peirce\)](http://en.wikipedia.org/wiki/Categories_(Peirce))

Another notion, that of the “three Universes” mentioned by Peirce above, refers to *experiential* Universes which, as he defines them, are conceptually related to his three phenomenological categories: *Firstness*, *Secondness* and *Thirdness*:

- i) *Mere Ideas* – experienced as *vague or indeterminate* (Firstness);
- ii) *The Brute Actuality of Things* – experienced as *discrete, observable* (Secondness);
- iii) *The Sign* – able to *act as intermediary* between an Object and a Mind (Thirdness).

Musement, in Peirce’s vision of it, kicks in initially as we idly sample a flow of fleeting impressions of some or other vaguely attractive aspect of an idea, a thing, or already existent sign. When one or other particular aspect of this flow of impressions captures our attention more than others, Musement nudges us playfully into engaging even more intimately with it, which, in its turn, may lead us to focus even more closely on it, think even more profoundly about it, and eventually seek to formulate reasoned arguments that may serve as a kind of common ground, and on which basis, we will be able, if we wish, to further expand our understandings of it by discussing it in even more depth with other interlocutors in a wider community of inquirers.

But now let us go back to the principle quote that is the object of this chapter, and seek to situate it more firmly within the broader context of Peirce’s *Hibbert Journal* article: “A Neglected Argument for the Reality of God”, which was written over a three month period in 1908 at the invitation of Peirce’s mathematician friend and colleague, Cassius J. Keyser.³ The most central premise for Peirce’s argument is his own observation that prolonged musement (or meditation) on the notion of God – conceived of as *Ens necessarium* – appears to have such a powerful attraction for us human beings so as to generate a firm belief in the reality of God, which, in its turn, may become instrumental in regulating the future conduct of our lives. Peirce opens his Argument on this point as follows:

The word “God”, so “capitalised” (as we Americans say), is the definable proper name, signifying *Ens Necessarium* [4], in my belief Really creator of all three Universes of Experience. Some words shall herein be capitalised when used, not as vernacular, but as terms defined. Thus an “idea” is the substance of an actual unitary thought or fancy; but “Idea”, nearer Plato’s idea of ἰδέα, denotes anything whose Being consists in its mere capacity for getting fully represented, regardless of any person’s faculty or impotence to represent it. (CP 6:452).

³ For further background information, see the main editorial introduction, and chapter notes on the N.A. in EPII: xxxi–xxii, 434.

⁴ Peirce’s footnote: “Necessary being, necessary entity”.

After a fairly intense section where he introduces and briefly defines a number of (capitalised) key concepts deemed fundamental for his discussion: *Real*, *Actual*, *Experience*, *Brute Actuality*, *Ideas*, *Being*, *Sign* and *Argument*, etc., Peirce moves on to examine the difference between the notions of “Argument” – which he defines as “any process of thought reasonably tending to produce a definite belief”, and “Argumentation” – which he defines as “an Argument proceeding upon definitely formulated premises”. This is clearly because he is about to attempt to qualify in more detail his own titling of the article as “A Neglected Argument for the Reality of God”, which he proceeds to do as follows:

If God Really be, and be benign, then, in view of the generally conceded truth that religion, were it but proved, would be a good outweighing all others, we should naturally expect that there would be some Argument for His Reality that should be obvious to all minds, high and low alike, that should earnestly strive to find the truth of the matter; and further, that this Argument should present its conclusion, not as a proposition of metaphysical theology, but in a form directly applicable to the conduct of life, and full of nutrition for man's highest growth. (CP 6:457).

Here, there are two points of particular interest, the first being Peirce's insistence that any Argument for God's existence and eventual benignness, “should be obvious to all minds, high and low alike”, and further, that the conclusion of such an Argument should necessarily be presented “in a form directly applicable to the conduct of life, and full of nutrition for man's highest growth”.

At this point, anyone who knows Peirce's work in some detail will quickly see connections to his notion of *Pragmaticism*, which, as he takes pains to explain briefly towards the end of the NARG article, he posited as an alternative term, in order to distinguish it from that of *Pragmatism*. This latter term was first proposed for a broader audience by William James, Schiller and others, and had thereafter been portrayed elsewhere, in “literary circles”⁵, as Peirce puts It in the NARG, in ways he was not willing to accept. James' initial public exposition version of pragmatism was nonetheless firmly rooted in an earlier definition by Peirce of a Pragmatic Maxim, which he formulated in a number of different forms, one of the most well known of which serves to present it here:

Pragmatism. The opinion that metaphysics is to be largely cleared up by the application of the following maxim for attaining clearness of apprehension: Consider what effects, that might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object. (CP 5.2).

5 See Peirce's 1905 *Monist* article for some of his opinions on this particular issue.

Where James and the other pragmatists in philosophical circles of the time appear to have differed most from Peirce was in their desire to communicate with, and to seek to convince a broadly eclectic audience of potential adherents of the practical societal utility of what they understood, and portrayed enthusiastically for others as a “modern” Pragmatist philosophy. It also seems that, in James’ view, it was most profitable to portray Pragmatism as offering refined innovative practices of normative inquiry to effectively guide scientific and other verification and decision-making processes in everyday life situations.

Peirce, on the other hand, was rather less concerned with the narrower issue of guaranteeing success in everyday (scientific or other) verification processes – i.e. by essentially managing to substitute an unpleasant sensation of doubt with the “satisfaction” of well reasoned beliefs, but rather, in more general terms, with the problem of what he, in another well-known article of the same name⁶, characterized as “How to Make our Ideas Clear”.

He envisioned his pragmatic maxim as just one small, albeit important, part of a far larger philosophical system combining ideas and methodological insights from aesthetics, ethics and logic, designed to further scientific inquiries into the origins of reason in being, nature, life and human culture. In particular, Peirce was concerned with unraveling the eternal puzzle of the actual origins and spread of human reason, which he, in line with Plato’s idea that reason is the spark of divinity within us, envisioned as a continuum of intimately intertwined “living” ideas, constantly under development, and characterized by what he referred to as the *growth of concrete reasonableness*.⁷ (CP 5.3).

According to Peirce, living ideas, which we, as human beings, have providentially and constitutionally been entrusted, require continual nurture in order to continue to grow and develop over time, hence his famous pronouncement: “It is not by dealing out cold justice to the circle of my ideas that I can make them grow, but by cherishing and tending them as I would the flowers in my garden” (CP 6.289; EPI 354).

In tune with his personal conviction that all our ideas, in some sense or other, have some aspect of the “divine” built into them right from their very origins (within a framework of an inconceivably long evolutionary timescale), it seems reasonable that Peirce would seek in his “Neglected Argument” to point to, and defend, the thesis that the living idea of our own “divine” origins, i.e. the

⁶ EPI: 124–141. Originally published in *Popular Science Monthly* 12 (January 1878), 286–302. <http://www.peirce.org/writings/p119.html>

⁷ See Colapietro (2004b) for a broader discussion of this particular issue, also online here: <http://www.cspeirce.com/menu/library/aboutcsp/colapietro/theoryofsigns.htm>

“hypothesis of God’s Reality” (as *Ens Necessarium*), in all its “concrete reasonableness” is something we “instinctively” are predisposed to believe, become profoundly affected by, and led to allow this belief to meaningfully regulate our conduct of the lesser realities of our individual and collective day to day lives:

... I do not think that I either am or ought to be less assured, from what I know of the effects of Musement on myself and others, that any normal man who considers the three Universes in the light of the hypothesis of God’s Reality, and pursues that line of reflection in scientific singleness of heart, will come to be stirred to the depths of his nature by the beauty of the idea and by its august practicality, even to the point of earnestly loving and adoring his strictly hypothetical God, and to that of desiring above all things to shape the whole conduct of life and all the springs of action into conformity with that hypothesis. (CP 6.467).

Of course, as we are all too well aware, the long history of the growth and spread of myriad regional and world religions, and the empirical fact that that strongly held religious beliefs have over the ages – indeed, right up to our present day – led us to enact, individually, or collectively, not only some of the most incredibly humane and benevolent, but also some the most incredibly inhumane and malevolent, acts towards others we consider “believers” like ourselves, and others we do not, appears paradoxically to both support, and at the same time, refute, Peirce’s gently optimistic philosophical musings.

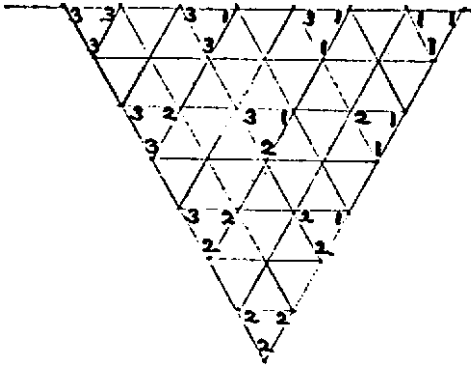
Peirce, for his part, could well have been imagined to respond to the above speculations as follows, as he points out in the final paragraph of his NARG:

... if Truth consists in satisfaction, it cannot be any actual satisfaction, but must be the satisfaction which would ultimately be found if the inquiry were pushed to its ultimate and indefeasible issue. (CP 6.485).

Priscila L. Farias¹ & João Queiroz²

82 On Peirce's Visualization of the Classifications of Signs: Finding a Common Pattern in Diagrams

Signs divided into Ten Classes.



The number above to the left describes the Object of the Sign. That above to the right describes its Interpretant. That below describes the Sign itself. 1 signifies the Possible Modality, that of an Idea. 2 signifies the Actual Modality, that of an Occurrence. 3 signifies the Necessary Modality, that of a Habit ... (L463:146; EPII:491, 1908).

In a draft of a letter to Lady Welby dated 24–28 December 1908 (L463:132–146), Peirce designed the diagram shown above, and added the ensuing comments.

In this chapter we focus on Peirce's diagrammatic method to visually model 10 classes of signs. As we know, this classification was developed from 1903, and represents a major refinement of the better-known division of signs into icons, indexes, and symbols, introduced in 1868, in "On a new list of categories" (CP 1.558, W2: 56), and in the 1903 Harvard Lectures on Pragmatism (CP 5.73–76). Although a number of philosophers and semioticians have shown interest, in recent years, for Peirce's 10 classes of signs, the extended typologies of signs, specially the 66 classes, still seem obscure, structurally intricate and hard to apply to actual phenomena. Such classifications should be considered as an important advancement with respect to the task of modeling the variety of signs,

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and constitute one of the most important topics of Peirce's mature semiotic. According to Houser (1992: 502), "a sound and detailed extension of Peirce's analysis of signs to his full set of ten divisions and sixty-six classes is perhaps the most pressing problem for Peircean semioticians".

An examination of Peirce's manuscripts, from 1903 to 1908, reveals that he devoted considerable attention to research and development of visual models for the 10 classes of signs, a fact that should not be considered surprising, given his association of diagrammatic reasoning with abductive inference and creativity (see Paavola 2011). Starting from an analysis of two diagrams for 10 classes of signs designed by Peirce in 1903 and 1908 – respectively, the diagram included in his *Syllabus* (CP 2.264; EPII: 296), and one shown above – this chapter provides a diagrammatic method to explain Peirce's strategy to design diagrams for ten 3-trichotomic classes of signs. Our main argument is that it is possible to observe a common pattern in the arrangement of Peirce's diagrams of 3-trichotomic classes.

The diagram shown above and also in figure 1, which we will refer to as the *Welby* diagram, was reproduced in the *Collected Papers* (CP 8.376) and in the second volume of *The Essential Peirce* (EPII: 491).

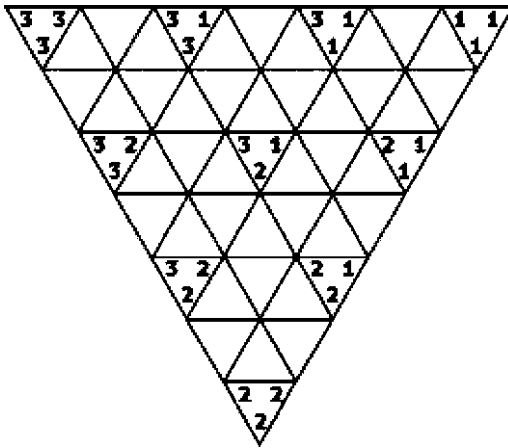


Figure 1: The *Welby* diagram (L463: 146), adapted from the versions published in the *Collected Papers* and in the second volume of *The Essential Peirce* (CP 8376, EPII: 491)

There are other versions of the *Welby* diagram among Peirce's manuscripts. Some of them, found in a manuscript dated 27 December 1908 (MS 399D: 627, figure 2), seem to be free-hand sketches for this diagram, which was finally rendered, most probably, with the help of a ruler or a similar instrument. What

is more crucial here is the position of the numbers that identify each class. In the sketch found in the lower part of the paper, the position of the classes and the figures used to identify them are identical to those found in the *Welby* diagram. Similarly, there are sketches for the diagram included in fifth section of Peirce's 1903 *Syllabus* (figure 4, MS 540:17; CP 2.264; EPII: 296) in his manuscripts (MS 540: 27–29, reproduced in figure 3; and MS 799: 2). All those sketches show that Peirce was very concerned in finding a coherent way to diagrammatically present the 10 classes.

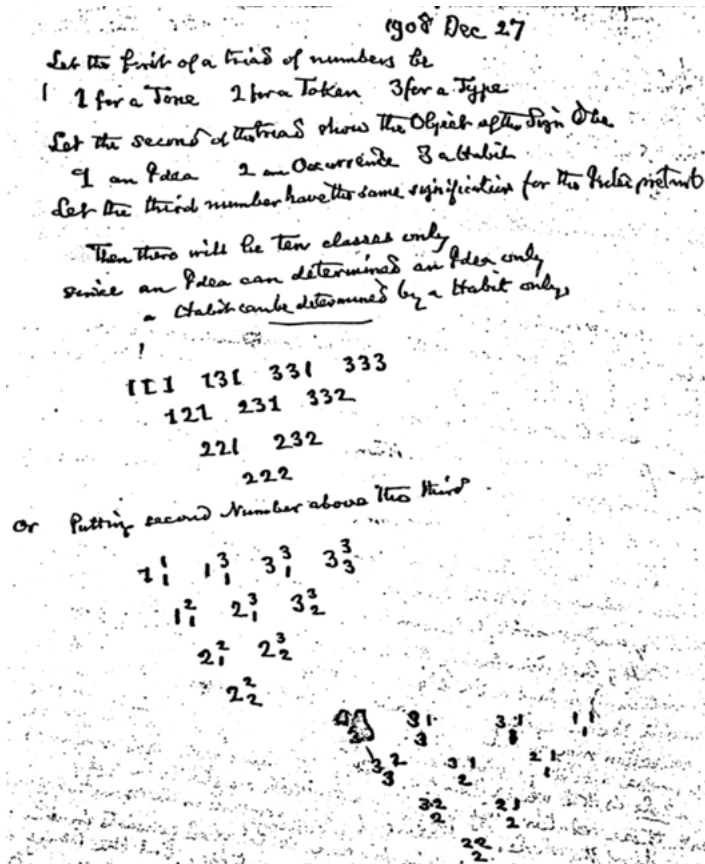


Figure 2: Sketches for the *Welby* diagram found in a manuscript dated 27 December 1908 (MS 399D: 627)

In order to proceed with our argument, we must produce comparable versions of the two diagrams. Figure 5 shows a simplified version of the *Welby* diagram, where the triangles that are not occupied by a class have been eliminated. Figure

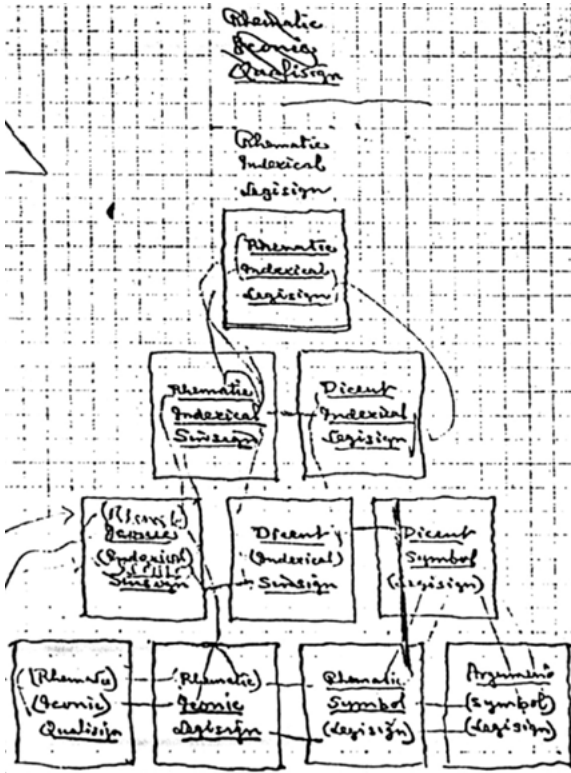


Figure 3: A draft for the diagram included in Peirce's 1903 *Syllabus*, found in manuscript MS 540: 27

6 shows a version of the *Syllabus* diagram where the names of the classes were substituted for numbers, according to the notation for the divisions of signs commonly adopted by Peirce scholarship (e.g. Weiss & Burks 1945: 386; Merrell 1994: 180; Serson 1997: 134; Sanders 1970: 7; Jappy 1984: 19), and also found in MS 799:4 (321 for rhematic indexical legisign, 211 for iconic sinsign, etc.). If we compare figures 5 and 6, we can infer that both show the same 10 classes in the same relative position, although the structure is vertically flipped. This happens if we consider that the occupied cells in the *Welby* diagram also present the classes as numbers.

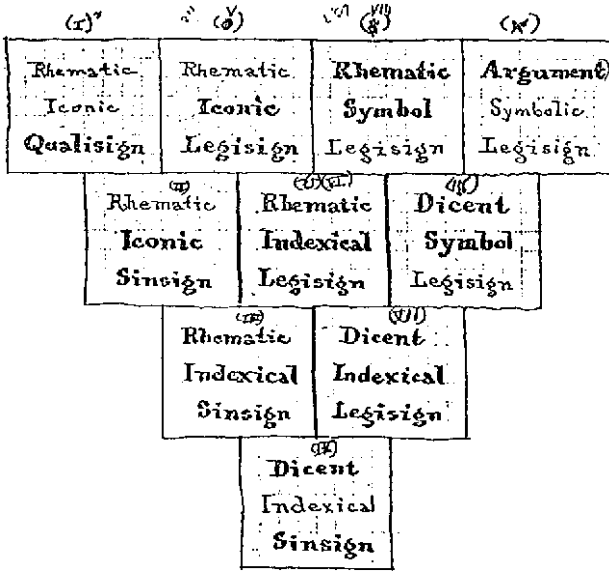


Figure 4: Diagram found in Peirce's manuscript (MS 540: 17) for his 1903 *Syllabus*

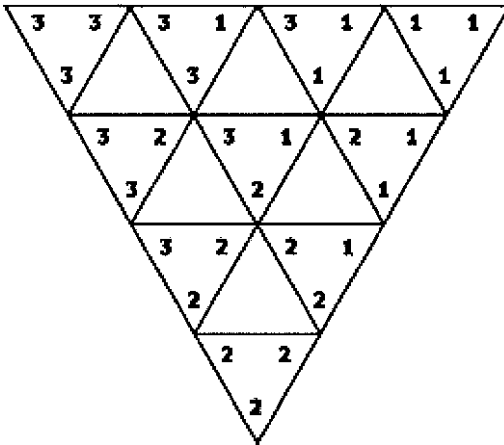


Figure 5: A modified version of the *Welby* diagram, created by the authors

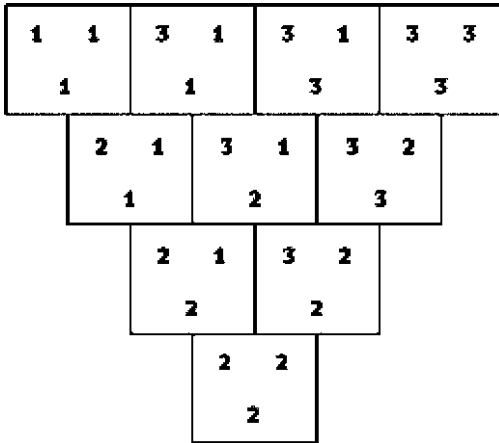


Figure 6: A modified version of the *Syllabus* diagram, created by the authors

But this seems to be in disagreement with the description of the diagram given by Peirce in the letter to Lady Welby, once “the number above to the left” in the modified *Syllabus* diagram corresponds not to “the Object of the Sign” (as in the *Welby* diagram), but to the nature of the sign in itself (EPII: 291). In a similar way, the number below, in the modified *Syllabus* diagram, describes not “the sign itself”, but “the relation of the sign to its Object” (EPII: 291). There seems, however, to be a certain agreement in what regards the number “above to the right”. According to the note that appears next to the *Welby* diagram, this number “describes [the Sign’s] Interpretant”, and in figure 6 it describes the way in which “[the sign’s] Interpretant represents it” (EPII: 291).

Finding a common pattern in Peirce’s diagrams

Despite the conflict in what regards the location of the trichotomies within the cellules, and the consequences of this conflict, it is possible to observe a common pattern in the location of the classes in both diagrams. This common pattern can be found even if it is not possible to establish an exact mapping between the classes described by each diagram and the ordering of the trichotomies. If the ordering of trichotomies in the *Welby* diagram is (O-S-I), while in the *Syllabus* diagram the implied order is (S-O-I), the classes described by each diagram may not correspond to the same 10 classes of signs. We will argue, however, that both diagrams follow the same underlying diagrammatic principle.

In order to do that, let us consider the numbering of the classes as following triangular coordinates,³ where a triplet (a, b, c) corresponds to the quantities of 'ones' (a), 'twos' (b), and 'threes' (c) that form each class, given by an ordered set of integers that vary from 0 to 3. The sum of the quantities of ones, twos, and threes that form each triplet/class will always be 3 ($a + b + c = 3$), once we are working with 3-trichotomic classes.

In the extreme corners of an equilateral triangle, we will locate triplets (0, 0, 3), (3, 0, 0), and (0, 3, 0), corresponding to classes 333, 111 and 222. In the middle thirds of the sides of the triangle, we will arrange the triplets that correspond to the sequence that is given by considering each side of the triangle as an axis where the elements of the triplets vary from 0 to 3 in respect to the triplets located in the corners – so that, for example, in the side that has (0, 0, 3) and (3, 0, 0) as its endpoints, we will have the sequence of triplets: (0, 0, 3), (1, 0, 2), (2, 0, 1), (3, 0, 0). Finally, in the center node, which can either be located by the crossing of the altitudes of this triangle or by uniting the nodes with line segments that are parallel to the sides of the triangle, we will place the triplet (1, 1, 1), that corresponds to class 321 (figure 7).

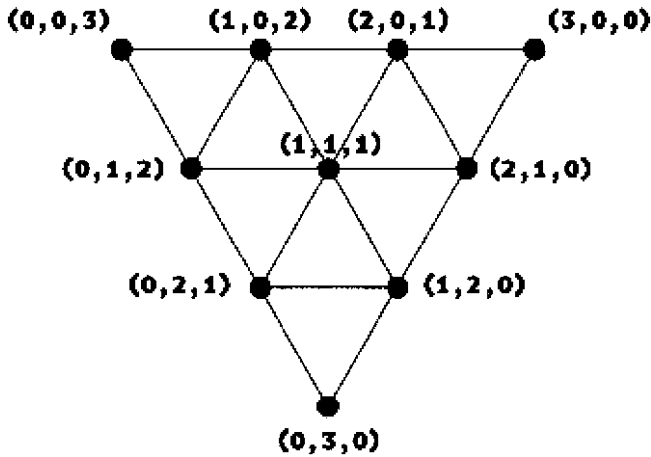


Figure 7: Creating a pattern of ten vertices from triangular coordinates

Now, having this pattern of 10 vertices, we can draw triangles around them and 'translate' the corresponding triplets into classes: (0, 0, 3) = 3 threes = 333;

³ The diagrammatic strategy applied here has been inspired by Shea Zellweger's (1991) approach to Peirce's triadic logic.

$(0, 1, 2) = 1$ two and 2 threes = 332; and so on (figure 8). We obtain a diagram that corresponds exactly to figure 5, the modified *Welby* diagram.

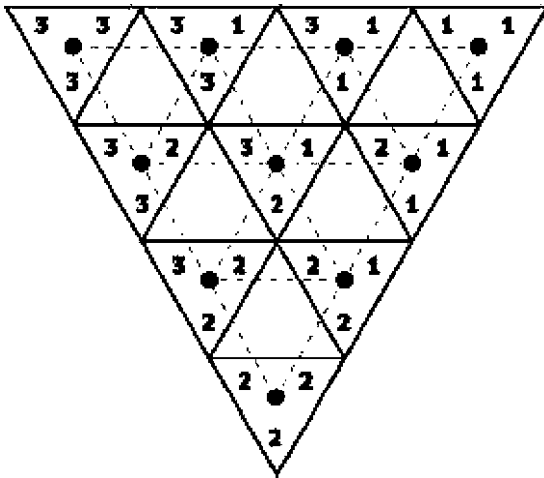


Figure 8: The *Welby* diagram re-designed around the triangular coordinates

If we invert the quantities of ‘ones’ and ‘threes’ in the coordinates – so that $(0, 0, 3)$ will correspond to 3 ones, and $(3, 0, 0)$ to 3 threes – and build squares instead of triangles around the vertices, we will obtain exactly the position of the 10 classes as found in the *Syllabus* diagram (compare figure 9 with figure 6).

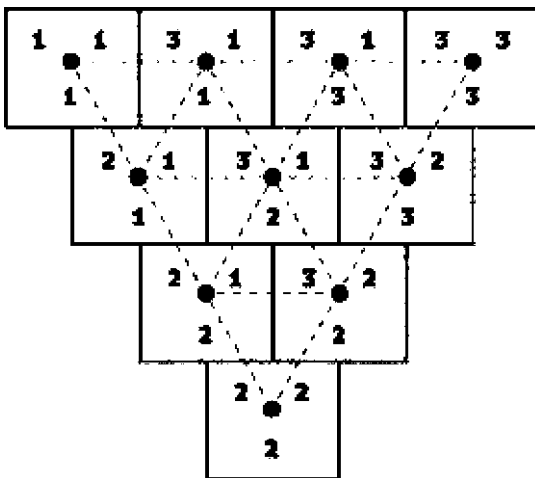


Figure 9: The *Syllabus* diagram re-designed around the triangular coordinates

This shows that the use of the diagrammatic method described above can explain the underlying principle of the design of Peirce's diagrams for 10 classes of signs, despite the fact that those diagrams may refer to different classifications of signs. As far as we know, Peirce never designed diagrams for 28 or 66 classes of signs, but it is fair to believe that in order to do that he would have applied the same principles used for his diagrams of 10 classes.

In previous work (Farias & Queiroz 2003), we showed that the diagrammatic method described above not only explains the underlying logic of the diagrams designed by Peirce, but can also be applied as a method for the construction of diagrams for any n-trichotomic classification of signs. This has led to the development of a computer program able to build equivalent diagrams for any n-trichotomic classification of signs (Farias & Queiroz 2004), which serves as a tool for the investigation of C.S. Peirce's theory of signs (Farias & Queiroz 2006). Understanding the underlying principles of the diagrams for 10 classes designed by Peirce is an important step towards the comprehension of his sixty-six classes.

Francesco Poggiani¹

83 Truth and Satisfaction: The Gist of Pragmaticism

My original essay, having been written for a popular monthly, assumes, for no better reason than that real inquiry cannot begin until a state of real doubt arises and ends as soon as Belief is attained, that “a settlement of Belief”, or, in other words, a state of satisfaction, is all that Truth, or the aim of inquiry, consists in. The reason I gave for this was so flimsy, while the inference was so nearly the gist of Pragmaticism, that I must confess the argument of that essay might with some justice be said to beg the question. The first part of the essay, however, is occupied with showing that, if Truth consists in satisfaction, it cannot be any actual satisfaction, but must be the satisfaction which would ultimately be found if the inquiry were pushed to its ultimate and indefeasible issue. This, I beg to point out, is a very different position from that of Mr. Schiller and the pragmatists of today. (EPII: 449–450, 1908).

On April 8, 1908,² Peirce received a letter from his friend Cassius Keyser, Professor of Mathematics at Columbia University, inviting him to contribute an article to the *Hibbert Journal*, of which Keyser was an editorial member. Two days later, Peirce answered gratefully and proposed a list of ten possible topics. Immediately after sending his reply, however, he started to work on an article, initially titled “A Little Known Argument for the Being of God”, corresponding to his third suggestion. By the end of June, Peirce concluded and turned in one of his most mysterious writings: “A Neglected Argument for the Reality of God”. One month later, Keyser told Peirce that Lawrence Pearsall Jacks, the *Hibbert* editor, had accepted the article, finding it to be a contribution of “permanent value”. At the same time, he had asked Peirce to add a brief conclusion containing a summary of his Neglected Argument (N.A.). Peirce replied by sending a script that looked less like a summary than a further elaboration on the topic, with a special focus on the place of the N.A. in the general theory of pragmaticism. This theme is indeed anticipated in the conclusive statement of the paper, in which Peirce defines the N.A. as “the First Stage of a scientific inquiry, resulting in a hypothesis of the very highest Plausibility, whose ultimate test must lie in its value in the self-controlled growth of man’s conduct of life” (EPII: 446). In the addendum to the article Peirce defines the N.A. (which he now calls “the humble argument”) as the first of a nest of three arguments, in which the third one encloses and defends the other two. Then, after an historical explanation of the genesis and

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² Cf. EPII: xxxi.

peculiar nature of his own form of pragmatism (renamed pragmaticism in 1905), he defines the third argument as “the development of those principles of logic according to which the humble argument is the first stage of a scientific inquiry into the origin of the three Universes, but of an inquiry which produces, not merely scientific belief, which is always provisional, but also a living, practical belief, logically justified in crossing the Rubicon with all the freightage of eternity” (EPII: 449). The presentation of this argument, Peirce continues, would require, besides the establishment of several principles of logic, a “strict proof of the correctness of the maxim of Pragmaticism”. It is at this precise point that the chosen quote begins: “My original essay . . .”³

The purpose of the passage is explicit: to describe the original formulation of pragmatism as both containing the gist of pragmaticism and failing adequately to support it. Accordingly, the immediate sense of the quotation is to give an account of what precedes it (the need to give a proof of the pragmatic maxim) and, at the same time, to qualify pragmaticism as both consistent with that original formulation and in some respects differing from the other pragmatists’ conception. To this extent, Peirce’s statement is only one instance among many of this kind.

What makes this passage worthy of deeper consideration, however, is Peirce’s explicit assertion that the gist of his pragmaticism could be described as a certain (precisely qualified) identification between truth and satisfaction. His objection to the pragmatists, in fact, is not that identification *per se*, but, within the framework of that identification, the *reduction* of satisfaction to *actual* satisfaction, namely, to use Peirce’s theory of categories, to pure instances of firstness and secondness. Hence, three main questions are to be answered: first, how should the thirdness of satisfaction (a *would-be* satisfaction) be conceived? Second, why does Peirce consider its identification with the truth as “nearly the gist of Pragmaticism”? Third, where should we look for this identification in “The Fixation of Belief” and why does the argument there provided beg the question?

We shall start from the third question. In the “The Fixation of Belief”, Peirce’s definition of inquiry rests upon the establishment of a firm difference between the notions of doubt and belief and, in particular, upon an interpretation of these concepts in terms of satisfaction (belief) and dissatisfaction (doubt). Peirce writes: “Doubt is an uneasy and *dissatisfied* state from which we struggle to free ourselves and pass into the state of belief; while the latter is

³ The essay referred to by Peirce consists of his two well-known articles published in 1877 and 1878 in the *Popular Science Monthly*. Since a few lines above Peirce had spoken of these two articles as “the two parts of my essay” (EPII: 448), the “first part” must refer to the “The Fixation of Belief”.

a calm and *satisfactory* state which we do not wish to avoid, or to change to a belief in anything else” (EPI: 114, *emphasis added*). In this way, Peirce intends to avoid the circular definition of truth as the aim of inquiry and inquiry as the search for truth. Rather, inquiry can be defined as the struggle to overcome doubt, and truth as the attainment of belief. Given the crucial importance of this difference between doubt and belief, Peirce proceeds to give a logical account of its validity (beyond all psychological considerations): if a method cannot be found that would allow us to satisfy our doubts, no clear difference could be established between doubt and belief, but only between different degrees of doubtful cognitions. Peirce finds such a method in the method of science: “To satisfy our doubts, therefore, it is necessary that a method should be found by which our beliefs may be caused by nothing human, but by some external permanency . . . Such is the method of science . . . The new conception here involved is that of reality” (EPI: 120). The difference between this method and the other three consists in the introduction of some kind of “objective” criterion for the attainment of satisfaction. In fact, while in all other methods it is entirely *up to us* to find out and resolve whether we are truly satisfied with a certain belief, in the method of science such resolution involves the application of the method, namely, the application of the *hypothesis* of reality. A doubt is a *real*, genuine doubt (not a paper doubt), and a belief is a *real*, full belief (not a make-believe belief), only to the extent in which they can be shown to be caused by “some external permanency” independent of what anybody think about it; if, for example, I believe that I am the current king of France, the validity of this belief cannot be adequately established by any (however strong) *feeling* of conviction, nor by any arbitrary collection of *single facts* that could be invoked to justify my belief, but only by the regular and systematic accordance of my belief with all the conceivable circumstances that would occasion its verification. Only the recognition of such regularity, in fact, would allow me to stabilize my belief. Now Peirce’s pragmatic maxim was precisely conceived as a methodological tool for the determination of all conceivable, regular habits of action that *would* ensue from the belief in the truth of any intellectual conception.

In light of these considerations, why does Peirce affirm that the argument of his essay might be said to beg the question? If the question of that essay is whether and how one can bring about the fixation of belief, Peirce’s answer leaves at least two problems unsolved: first, how can a belief or idea, which in itself is a purely intellectual event, bear practical consequences? Second, what makes an actual or conceivable habit of action stable, namely self-satisfied?

With regard to the first question, Peirce was indeed well aware that his pragmatism was “scarce more than a corollary” of Bain’s definition of belief (CP

5.12). But this definition merely re-proposes the question, insofar as to say that a belief is *something upon which one is prepared to act* does not yet say anything about what makes an idea capable of preparing and generating action.

With regard to the second question, Peirce's abovementioned appeal to the notion of reality as "external permanency" could explain neither the real conditions of a progressive settlement of belief, nor the entire meaning of such an ideal experience of satisfaction. It could only indicate the (hypothetical) direction of such an explanation. The pragmatic clarification of the idea of an independent reality as the final opinion of an infinite community of inquiry, while serving the important function of liberating Peirce's pragmatism from any trace of Kantian nominalism, introduces the crucial idea that a definite settlement of belief could never be achieved from the point of view of the individual; while it is difficult to exaggerate the importance of this claim, it does not represent an exhaustive answer to the question of the settlement of belief, but only one of its necessary conditions.

Peirce's original formulation of pragmatism thus announced and required a radical redefinition of the modern conceptions of belief and reality. As long as we keep regarding the belief as mental representation of a reality that is unknowable in itself, we will never be able to understand how ideas can bear real consequences, nor how a doubt could ever be adequately satisfied. The classical definition of truth as *adequatio rei et intellectus* requires overcoming the abyss Kant established between these two terms. Peirce is one of the few modern philosophers who attempted to do so without neutralizing either the cognizability of reality or the reality of belief.

Peirce's effort to arrive at a novel understanding of reality and belief is expressed by his insistence on the crucial importance of two consequences of pragmatism: scholastic realism and critical common-sensism, which could be regarded, respectively, as the metaphysical and epistemological sides of pragmatism (cf. CP 5.504). Peirce's version of scholastic realism, which affirms that some real objects are *general*, offers a metaphysical account of how general ideas can have practical effects, both within and beyond the horizon of our individual life. Critical common-sensism, which affirms the *vague indubitability* of certain beliefs and inferences, can be used to explain how those real ideas are capable of generating increasingly stable (self-satisfied) habits of thought and action.

A belief can have practical consequences if its object is a real symbol, namely something whose being consists in the "mode of determination of existent singulars" (EPII: 354). Insofar as the object of my belief is a real symbol, then, I will be determined, upon relevant occasions, to embody its "idea-potentiality"

in my actions. Embodiment, Peirce claims, is a necessary condition for the growth and preservation of the symbol itself. “Without embodiment in something else than symbols, the principles of logic show there never could be the least growth in idea-potentiality” (EPII: 388). However, of the “myriads of forms” in which a symbol, for instance a proposition, could be translated or interpreted, what is its *true* meaning? “It is, according to the pragmatist, that form in which the proposition becomes applicable to human conduct, not in these or those special circumstances . . . but that form which is most directly applicable to self-control under every situation, and to every purpose” (EPII: 340).

The identification of the conceivable practical consequences of ideas with *deliberate* or *self-controlled* habits of action is the main novel feature of Peirce’s mature characterization of pragmatism. From the perspective of his reflection on the normative sciences, we can distinguish two steps toward a pragmatistic account of self-control: first, the classification of logic as a special case of ethics (or *practics* (cf. EPII: 377)), whence the definition of reasoning as a highly self-controlled form of conduct (cf. EPII: 251); second, the foundation of logic and ethics on esthetics, whence the recognition that “at the very bottom of the meaning of a thoroughly rational thought there is a comparison with an esthetic ideal vaguely conceived” (CSP-FCSS 1905). How does this comparison work? In one passage, Peirce makes clear that the role of self-control is not to impart “any arbitrarily assignable character” to future action; it is rather a process of self-preparation that “will tend to impart to action (when the occasion for it shall arise) one fixed character [namely, it will tend to conform action to a certain esthetic ideal], which is indicated and perhaps roughly measured by the absence (or slightness) of the feeling of self-reproach, which subsequent reflection will induce. Now, this subsequent reflection is part of the self-preparation for action on the next occasion. Consequently, there is a tendency, as action is repeated again and again, for the action to approximate indefinitely toward the perfection of that fixed character, which would be marked by the entire absence of self-reproach” (EPII: 337).

It is my contention that although Peirce’s engagement with esthetics is limited to brief and scattered reflections, his profound insights on that subject found new expression and development in the doctrine of critical common-sense. Two essential features of that doctrine are, first, that “all the veritably indubitable beliefs are *vague*” (CP 5.505), and second, that the *veritable* indubitability of such beliefs can only be established through the method of pragmatic doubt. Peirce explains: “The Critical common-sensist’s personal experience is that a suitable line of [reflection], accompanied by imaginary experimentation, always excites doubt of any very broad proposition if it be defined with preci-

sion. Yet there are beliefs of which such a critical sifting invariably leaves a certain vague residuum unaffected” (CP 5.507). Although Peirce does not explicitly draw this connection, there is a manifest affinity between the critical common-sensist’s experience and the esthetic development of self-control described above: a *truly indubitable* belief is such that any attempt to excite a doubt about it always leaves a certain vague residuum unaffected; accordingly, a *truly admirable* ideal is such that actions that are at variance with it always excite, upon subsequent reflection, a feeling of self-reproach. There is therefore an essential connection between the emergence of truly indubitable beliefs and the embodiment of admirable ideals, hence between the gradual fixation of belief and the experience of satisfaction.

However, since ideals, like any other symbol, are inherently vague and general objects, no finite sum of actions will ever be able to *fully* realize an esthetic ideal, and the general perspective of a *total* satisfaction will always in principle remain a task ahead of us. This is why, Peirce insists, no *actual* satisfaction will ever amount to a *full* possession of the truth, as much as no sum of actual beliefs will ever be able to completely determinate the (objectively) vague residuum of a truly indubitable judgment. The moment one tries to reduce the whole truth to an actual experience of satisfaction, the latter is identified with blind feelings of pleasure, and the former with the oscillations of those feelings (hence Peirce’s opposition to Christoph Sigwart’s attempt to ground logical soundness in feeling). There is, however, an important difference between pleasure and satisfaction. As Peirce writes in an unpublished draft of the first Lowell Lecture (1903), while pleasure is an “individual event”, satisfaction “is an accord between an event and an object of desire which object is an idea essentially general in its nature”. It is “the perception that an event is of a certain general description . . . a mental perception” (MS 451: 11–12).⁴ As such, any experience of satisfaction always refers to the possibility of a greater fulfillment, namely of a more perfect embodiment of the general object of desire.⁵

⁴ “Accordingly, Peirce writes in another place, “while in esthetic enjoyment we attend to the totality of feeling, . . . yet it is sort of intellectual sympathy, a sense that here is a feeling that one can comprehend, a reasonable feeling” (EPII: 190). In this sense, the satisfactory is not “whatever excites a certain peculiar feeling of satisfaction” (CP 5:559); in other words, Peirce’s appreciation of the notion of satisfaction is not an acclamation of Hedonism.

⁵ Accordingly Peirce writes: “In general, the good is the attractive, – not to everybody, but to the sufficiently matured agent; and the evil is the repulsive to the same. Mr. Ferdinand C.S. Schiller informs us that he and James have made up their minds that the true is simply the satisfactory. No doubt; but to say ‘satisfactory’ is not to complete any predicate whatever. Satisfactory to what end?” (EPII: 379).

To conclude, by 1908 Peirce arrived at a greater appreciation of his pragmatism's implications for a new conception of truth as conditional (hence *cognitive*) satisfaction. To investigate the totality of these implications and to compare them, without confusing them, with the simultaneous efforts of the other pragmatists might represent an effective strategy to finding our way among the unsettled questions generated by Peirce's unique philosophical insights.

Yunhee Lee¹

84 Collateral Experience and Interpretation: Narrative Cognition and Symbolization

We must distinguish between the Immediate Object, – i.e., the Object as represented in the sign – and the Real (no, because perhaps the Object is altogether fictive, I must choose a different term, therefore), say rather the Dynamical Object, which, from the nature of things, the Sign *cannot* express, which it can only *indicate* and leave the interpreter to find out by *collateral experience*. For instance, I point my finger to what I mean, but I can't make my companion know what I mean, if he can't see it, or if seeing it, it does not, to his mind, separate itself from the surrounding objects in the field of vision. (CP 8.314, 1909).

Two Objects and three Interpretants

From the perspective of sign as action in teleological semeiosis, the triadic action is characterized as determination. That is to say, the dynamical object as purpose determines the sign action and, in turn, it determines the interpretant to be connected with the dynamical object. In this way, the dynamical object determines both sign and interpretant immediately and mediately, respectively. The sign functions as a primary medium between the dynamical object and interpretant, and thus the interpretant becomes related to the dynamical object through the immediate object with the effect of interpretation to the interpreter. At the same time, the interpretant functions as a secondary medium connecting the sign with the object. This triadic relation shows that semeiosis reveals itself in three modes, that is, process, result, and effect. The two types of semeiosis, the teleological and the teleonomic, are similar to the extent that a triadic relation can be operated (Liszka 1996: 33). However, the triadic action in teleonomic semeiosis is not genuine, inasmuch as sign does not elicit the agent in the same way as teleological semeiosis does, in terms of ability of interpretation of the sign with an emotional-volitional act. Therefore, a dynamism in teleonomic semeiosis indicates that the sign-interpreting agent, that is a quasi-mind², is only to deal with signs in view in the way of action and reaction within a dyadic relation. Even though a quasi-mind shows a symbolic action, the action is considered as an effect of habitual behavior. Now, the point that I wish to make is that teleological semeiosis requires the sign-interpreting agency whose mind performs emotional-voluntary action, which is a prerequisite for consciousness of the ultimate goal,

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² For Peirce's definition for a quasi-mind, see CP 4.551.

along with awareness of the reality of the object as cause, and thus interprets accordingly. As a result, the interpretant as a means connects sign (action) with object (purpose).³

Peirce made it clear that two kinds of objects and three kinds of interpretants are in correspondence in an analogous way; however, they are different in the way that “the Object is the cause, the Interpretant is the effect of the sign”. He added, “As effect it [Interpretant] extends into futurity and therefore the logical interpretant must be, in some sense, in the *future tense*” (MS L327.5: 287 quoted from Ketner). This demonstrates a further point that every sign has an immediate object and an immediate interpretant with direct consciousness of the object. In the same passage, Peirce implies that Real Object is analogous with “Existential Interpretant, or the actual events which the sign, *as sign*, may bring about, by however indirect a process” (MS L327.5: 287 quoted from Ketner). The definition of the real object here is mediated by the sign, not expressed in the sign. Peirce later prefers dynamical to real, due to the fact that the object can be fictive altogether (CP 8.314). The immediate object is partially expressed in the sign and the dynamical object is indicated by the sign; thus, the two objects are related to each other in the way that one is partially determined by the other. Consequently, three interpretants function as habits of conduct, which are caused by two objects in the form of immediate consciousness, actual event as a process, and prognosis.

In particular, the dynamical interpretant as the effect of the Sign can lead to a logical interpretant as a ‘would-be’ effect in the future, practiced by the agent’s emotional-volitional act. In this way, the two objects and the three interpretants are connected by the process of sign action in an indeterministic cause-and-effect relation. More importantly, collateral experience of the sign-interpreting agency and the two Objects as cause allows the interpreting mind to experience learning activity. Based on this point, I will look closely at the character of the agent’s collateral experience, which is represented in a narrative form at a discourse level of inquiry.

Interpreting agent: ‘Choice’ and not cause

Interpreting activity is a dynamism in action to produce a real effect on the sign-interpreting agent. Ketner suggests that Pragmaticism is equivalent to Existentialism, in the sense that the two have a common character, in which both

³ Liszka uses the triadic relationship between goal, means, and action to explain intentional behavior, which is analogous to semeiosis in a triadic action, corresponding to Object, Interpretant, and Sign, respectively. This action cannot be reduced to a causal relation of dyadic action (Liszka: 32).

understand a person as “the reality of persons: acting, choosing, suffering, living, searching, interpreting, dying beings” (Ketner 1995: 291). While Ketner regards Existentialism as Humanism with the maxim, man is “condemned to be free” (Ketner 1995: 293), he similarly states that Peirce’s pragmatism means “we are condemned to interpret” (Ketner 1995: 294). Ketner concludes by saying that the very word ‘choice’, used by Sartre with great emphasis, is the equivalent notion of Peirce’s interpretation (Ketner 1995: 295).

The notion of choice in the human agency is a core element for understanding human subjectivity. Even though the world we are living in seems to be dominant with efficient causes, a voluntary action and a right to choose are necessary elements for a dynamism in human action in a triadic relation by means of sign-use inwardly and outwardly. According to Ketner, Peirce’s concept of ‘choice’ can be described as a logical method, namely interpretation, which is characterized not as tenacity, authority, or fashion, but as a logical process in *semeiosis*, as Peirce writes:

Yes, the other methods do have their merits: a clear logical conscience does cost something – just as any virtue, just as all that we cherish costs us dear. But we should not desire it be otherwise. The genius of a man’s logical method should be loved and revered as his bride, whom he has chosen from all the world. He need not condemn the others; on the contrary, he may honor them deeply, and in doing so he only honors her the more. But she is the one that he has chosen, and he knows that he was right in making that *choice*. (CP 5.387, emphasis added).

This passage also suggests that sentiment in community of inquiry and feelings and desires in individuals are involved in the act of interpretation. With affection, a voluntary action of performing a logical method can be realized in an actual event. The practice of a sign-interpreting agent for interpretation is dependent upon collateral observation and experience associated with the concept of “non-alibi in being”⁴ in Bakhtin’s terms. For Peirce, experience belongs to Secondness with double consciousness, which is “two-sided consciousness” (EPII: 268) with perception and volition. External experience as a mode of immediate consciousness and internal experience as a mode of mediate consciousness are combined as action-and-reaction, such as in the pairs of ego and non-ego, effort and resistance. In this sense, thought as event (CP 5.288) is necessarily connected with a previous thought. The experience of recognizing

⁴ The concept of non-alibi in being in Bakhtin, referring to a “human being has no right to an alibi” (Bakhtin 1993: xxii), is analogous to the actual existent in *haecceity*, or pure Secondness in Peirce’s concept, that is, the being with “the brutal fact that will not be questioned” (CP 1.405).

differences between the two thoughts as a sense of change (CP 1.335) is called internal experience with intellectual effort. As Peirce acknowledged, consciousness is a mere feeling in life's experience, which has three psychological categories: "1st, monadic experiences, or simples ..." as primisense, "2nd, dyadic experiences, or recurrences ..." as altersense, "3rd, triadic experiences, or comprehensions ..." (CP 7.528) as medisense.

For the concept of experience from Peirce's category of psychology, it can be understood that my experience becomes our experience in discourse community. Peirce stated this point clearly regarding the connection between individual and community:

The course of life has developed certain compulsions of thought which we speak of collectively as Experience. Moreover, the inquirer more or less vaguely identifies himself in sentiment with a Community of which he is a member, and which includes, for example, besides his momentary self, his self of ten years hence; and he speaks of the resultant cognitive compulsions of the course of life of that community as Our Experience. (CP 8.101).

According to Peirce, thought is dialogic in form and "the man is the thought" (CP 5.314); thus, man is a dialogical being, performing his experienced thoughts by virtue of symbolic artifact. This fact requires a means of representation of experience for communication. Hence, collateral experience in community becomes our cultural experience for performing an act intersubjectively. It leads to contextual learning and cultural development by way of artifact, where the immediate object leads us to discover the meaning of dynamical Object in an actual event. Our experience is gained by joint attention with the social and historical background, which is associated with collateral observation and experience. Cultural activity through symbolization by community members encourages the practice of a logical method with emotional-volitional tone, so as to develop into collective collateral acquaintance with an object.

Immediate objects are partially expressed in signs and dynamical objects are collaterally expressed in life's events. In this sense, the interpreting agent functions as "mere cells in a social organism itself" (CP 1.647) for collective cultural mind. In this regard, the universe is perfused with signs as indicating (denoting), expressing (connoting), and symbolizing for interpretation. Peirce stated the relationship between experience and interpretation as learning activity as follows: "Inference in general obviously supposes symbolization; and all symbolization is inference" (W1: 280); "... all our thought begins with experience" (W1: 282); "The interpretation itself is experience (CP 7.526); "... all experience involves time" (CP 7.535); "... all learning involves the flow of time" (CP 7.536); "... the essence of experience lies in the manner in which it contributes to knowledge" (MS 299).

It is clear that collateral experience and interpretation involve contextual learning, both in an individual and in the collective domain, as a joint activity through a responsible action. Specifically, Peirce argues that experience contributing to knowledge is gained by symbolization of things, forms, and symbols, by virtue of hypothetical inference, deduction, induction as a logical method of inference, and reasoning (W1: 280–283).

Every thought is an event that occupies time. As a result, each thought requires connection with others, following the logic of relation, as in the category of symbolic representation. Thus, each event of thought presupposes a sequence for forming the whole from fragments. Following Peirce's example, the separately written words 'man' and 'dog' do not constitute a symbol of 'man and dog' (W1: 281). Hence, symbolization of form in denotation and thing in connotation and symbol information presuppose a sequential episodic thought, which connects parts to form the whole. As Aristotle said, representation of an event consists in a whole with a sequence of beginning, middle, and end.

As an interpreting activity through a testimony, which is invaluable for building hypothetical inference in the course of symbolization of thing, interpreter creates a new predicate for a Subject. This, in turn, becomes a new idea of the Object. This process is entirely dependent on probability, that is, abductive inference, which needs to be measured critically. Peirce defines probability as "... nothing but the degree to which a hypothesis accords with one's preconceived notions" (CP 7.177).

Representation of experience: Categories of narrative

The interpreting agent practices the act of inference and interpretation through experience in life-event as actual existent. I suggest that the experience of learning activity is represented in a narrative form, with application of a diagrammatic concept in Peirce's logic. This is a preliminary sketch, attempting to demonstrate the representative type of such an interpretative process of a logical method, as in hypothesis-deduction-induction. The narrative sign is a proper medium, which has a capacity of representation of a course of life on a discourse level.⁵ Narrative as a whole is considered as a form of process from problem – finding to problem-solving. Hence, there are three stages in narrative: firstly, progression as problem-finding; secondly, procession as performing an act; and thirdly, transition as problem-solving. The process operates in a spatial-temporal

⁵ For Peirce's approach to literary text, see Stjernfelt (2007) and Sheriff (1989).

way for thinking in mental space. From this aspect, a course of life is a continuous process of narrating as a form of representation of both imitating action mimetically and describing it diegetically in time. In this sense, being-as-event in Bakhtin's terms (see Bakhtin 1993: 2) can be characterized as a storytelling animal. A unit of episodic event composes a sequence of action in searching for the meaning of Object. The sequence of events is associated with a concept of continuity, and this eventually composes a course of life.

As Sheriff (1989: 48) states, Peirce's theory of sign is applied to narrative text for creation of "a theory of interpretation". In this respect, the narrative text enables the reader to participate in an emotional-volitional tone. As I mentioned above, a testimony or historical discourse deals with likelihood or probability, aiming at the credibility of the story in pursuit of truth of the object. In this sense, the essence of narrative involves knowing as etymology indicates.⁶

In this regard, narrative as representation of argument is divided into three categories as follows: first, story, which is the representation of the first concept of the object as hypothesis in the form of plot; second, narrative, which is the representation of the second concept of the object as embodiment in the form of characterization; third, narration, which is the representation of the third concept of the object as narrative message in the form of explanation.

I will explain each item with an outline. These three categories are based on logic of relation as in univalent, bivalent, and trivalent relations representing experience. First, story is characterized as abstract with high probability for signifying. Thus, the object is presented as monadic character in a form of univalency: [()+Be]. This is a diagrammatical concept of direct and simple experience by similarity through a conceptualizing metaphor. Second, narrative is described as a dyad involving two monadic characters in actual circumstances with subject indicating or denoting object as an opposing pair. Thus, subject with a monad denotes object with another monad, by means of a dyadic action representing each direct experience of an opposing pair in a diagrammatic concept of bivalency: [()+V+()]. As Peirce stated, "purely dyadic is either demonstrable or is too evident to be demonstrable" (CP 6.332). And yet, Peirce argued that this dyadic action was "merely member of a triadic action" (CP 6.332), implying the triadic pattern in the action. It is narration that represents an explanation of the connected experiences to understand the significance of habits of conduct. Thus, three monads and three dyads, by virtue of triadic action through welding and fusing, draw a law of pattern as our experience in the universe of discourse as trivalency: [()+V+()+()].

⁶ According to White (1980: 1: note2), the words, "narrative", "narration", "to narrate", and so on derive from the Sanskrit root *gnā* ("know").

In this respect, the act of narration can be understood as a cominterpretant for 'universe of discourse'.⁷ Peirce mentions the story of Hamlet, who is not an actual existent and yet functions as a dynamic object for the reader performing interpreting activity on what a monadic character in a possible action denotes and signifies. According to Peirce, a universe of discourse where two minds are welded and fused is a prerequisite for a cominterpretant to be established in communication (CP 4.172; CP 2.536; CP 8.179; Liszka 1996: 92).

Concluding remarks

In terms of communication, what is transmitted is form or ground⁸. The narrative medium provides representation of human action, with the reader to understand human complex minds by means of a storyworld as communication means. The feature of narrative is unlike a faculty of language, inasmuch as narrative is able to represent human action developing as our experience. In this sense, our experience of collectivity is represented in various narrative forms such as novel, poem, drama, mythology, biography, historiography, and so on, as a testimony on an individual and collective basis. Narrative is a dialectic method for cultural activity where the act of assertion takes place.⁹ This can be characterized as narrative dialectics where each experience is dialogic in denoting, signifying, and explaining.

The essential element of the semeiosis of generating symbols is the emotional-volitional interpreting agent that employs collateral observation and experience. This process implies a communication act with joint attention. The shared object reminds us of the determinate character attributed to the object. This is a collective memory for future interpretation in order to accomplish successful communication.

Intercultural or intracultural community discourse requires the same level of communication act with joint attention and shared meaning of object. Experience as interpretation between the two percepts and two concepts in two different discourses is represented by virtue of narrative dialectics. As Stjernfelt (2007: 342) states, a literary text for thought experiment comprises the interpretation cycle of "abduction-deduction-induction", while narrative discourse in the Peircean semeiotic is no more than argument sign at the textual level for intercultural communication based on collateral observation and experience at the individual or communal level.

⁷ For Peirce's concept of 'universe of discourse', see CP 6.351.

⁸ Form is similar to the ground of Sign, or a quasi-platonic form, which is communicated between utterer and interpreter (CP 1.551; W1:522; SS 196).

⁹ Walker Percy 1975 suggested that culture was "the ensemble of all the modes of assertory activity" (222).

Giovanni Maddalena¹

85 “Don’t You Think So?”

There is a celebrated passage in the second edition of the *Critick der Reinen Vernunft* and a very notable one, in which Kant says that the “I think” – *Das Ich Denke* – must be able to accompany all his ideas, “since otherwise they would not thoroughly belong to me”. A man less given to discoursing might remark on reading this: “For my part, I don’t hold my ideas as my own; I had rather they were Nature’s and belonged to Nature’s author”. However, that would be to misinterpret Kant. In his first edition, he does not call the act “the I think” but “the object=x”. That which that act has to effect is the consecution of ideas; now, the need of consecution of ideas is a logical need and is due not, as Kant thinks, to their taking the form of the *Urtheil*, the assertion, but to their making an argument; and this is not “I think” that always virtually accompanies an argument, but it is: “Don’t you think so?” (MS 636: 24–26, 1909).

This passage is part of manuscript 636, written between the 22nd and the 30th of September 1909 and named as “Meaning”. It was one of the drafts for the alleged Preface to the new publication of the “The Fixation of Belief” and “How to Make our Ideas Clear” on *The Monist*. Peirce was eager to republish the series of the *Popular Science Monthly* with the amendments that were the fruit of his late years of research as he wrote to Paul Carus in a letter written on January 6, 1909 (L77). He never succeeded to terminate the work, but the block of the MSS 635-(636)-637 forms a unitary paper (MS 636 is a first draft of the more complete 637), which can make us understand the direction taken by Peirce’s research in his late years.

The passage is significant as one of those in which Peirce’s late realism emerges in an istic form. In a few lines we understand Peirce’s later developments of thought, the inception of a new form of realism (1) and the kind of human responsibility that it implies (2). Finally, starting from passages like this one, it is possible to imagine a new way to consider the synthetic drive of pragmatism, far away from Kant’s patterns of thought (3).

1) Peirce’s late developments of thought: anti-Kantianism and metaphysical realism. The first development is the abandonment of Kantian positions, which is a point sometimes overlooked by scholars. Most critics still think of Peirce’s philosophy as profoundly Kantian from the beginning to the end of his life and career (cf. Bernstein 2006 or Pihlstrom 2010).

Recent studies have shown that Peirce’s reading of Kant was only nominally loyal to Kant at the beginning (Chevalier, forthcoming) and that the shift toward

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a more and more Hegelian view is really a mark of Peirce's development of thought throughout the last decades of his existence (Colapietro 2004a).

In manuscripts 635–636–637 Peirce shows the theoretical point of detachment from Kant. His mention of the difference between the first and second edition of the *Critic of Pure Reason* reveals his view. What Peirce could not accept from Kant was his central view of the distinction noumenon/phenomenon and the concept of the Self as transcendental apperception.

He also argued on the first topic in his youth. The unfortunate distinction shoves a gap between reality and knowledge. It was already clear from the '70s that Peirce identified in this gap the true meaning of nominalism. A "Realist" is he/she who considers reality as knowable in all aspects, no matter how long will be the road of inquiry to know it. A "Nominalist" is he/she who thinks that at a certain point knowledge is not possible and that we have to either bridge a gap with reality through some magic, undefinable tool as "intuition" or to declare the enterprise of knowledge as impossible or irremediably false. Appreciating the first formulation of the celebrated passage, Peirce does not defend the "thing-in-itself" or the noumenon. On the contrary, he defends the transcendental unity of the object as a property of reality itself. This is why he called himself an idealist-realist or an objective realist.

The second argument is the one against the transcendental apperception. The Kantian "Self" is a tool to grant the consistency of the relationship reality/knowledge. In Peirce's late realism there is no need of this sort of guarantee because there is no gap between reality and knowledge. Knowledge is one of the many ways in which reality develops. There are no internal and external sides of knowledge. Knowledge is all obtained from the exterior, as Wittgenstein will argue years later (Calcaterra 2003), since for Peirce knowledge is constituted by a flux of phenomena and semiosis that – respecting the pragmatic maxim – would find a final settlement in truth, if inquiry will be carried on in an ideal, long run spectrum.

A corollary on idealism follows this first attack on Kant. Sure enough, there is a self-controlled participation to human thoughts, and thus there is room for human freedom and interiority. However, this freedom is not a super-human idealist version of the Self. Peirce's conception of the Self is not grandiose. Human beings' nature is described through Shakespeare's words as their "glassy essence" (EPI: 55), something that we realize thanks to the negative difference made by our ignorance. This passage shows the ironical dismissal of the idealist possibility of an overestimation of the Self, whatever its description would be.

Finally, for completion of the argument, there is also a third implicit critique to Kant that does not appear in this passage but is typical of Peirce's late philosophy: the profound unity of disciplines, instead of Kant's strict separation

between areas of knowledge. The phenomenological and semiotic flux make all elements of reality and knowledge work together, like the fibers of a rope do (EPI: 29).

2) Responsibility. The same passage shows the way in which Peirce understands the self-controlled action of human beings. We are part of reality and we belong to it, but this does not mean that we are not responsible. Our responsibility plays as an answer to the interrogation of reality. The ironic “don’t you think so?” underplays the egotistic importance of the Self, but at the same time shows that Nature (or Reality) cannot act without us. Self-control is really only the gate at which reality enters and exits (EPII: 241). Our selves play a humble but decisive function.

As articulated as it can be, our answer is mainly an acceptance or a refusal. This acceptance consists of an assent to the proposal that reality makes. This assent has three elements: semiotic, ethical, and psychological. According to semiotic distinction, assent is a dynamical interpretant: it is the moment in which the process of semiosis that has been mechanical or unconscious requires for its nature a self-controlled answer. From the psychological point of view, this answer is part of that dialogue between ego and not-ego, which is Peirce’s definition of consciousness (EPII: 153–154). From the ethical perspective, assent is the moment in which we choose whether what the semiotic process proposes is ‘good’ or ‘bad’ (EPII: 252). In a very attractive and innovative view, Peirce reads this ethical level in an epistemic way. Far from being a moralist, he used ethics as the instrument to value goodness and badness of logical arguments. In this way, ‘good’ becomes ‘plausible’, as Peirce says in the article “A Neglected Argument for the Reality of God” (EPII: 434). Moreover, goodness and badness are judged according to a sort of order, which is the “concrete reasonableness” that aesthetics explores (EPII: 255; CP 5.3).

When Nature asks: “don’t you think so?”, she does not make fun of us. She asks that seriously. She asks through a semiotic process that reaches us, and requires a complex act of assent in which consciousness and our normative experience are called to answer. We are a fragile glassy essence, but our “yes” decides of the direction that reality takes. It looks like a paradox: we are nothing and still we can decide something for the entire reality. Facing the same paradox, J.R.R. Tolkien used to define our role as one of ‘subcreators’ (Tolkien 1964): we cannot create reality, but we can modify its development with our ‘yes’ and ‘no’.

3) New synthesis. Finally, this strong critique to Kant opens up a different way to look at philosophy. In particular, Peirce’s pragmatism elaborated tools that can change the definition and the use of “synthetic” reasoning. According to Kant, synthesis is the possibility to know something new, singular, not included in the concept from which we start. Synthesis can attain certainty when it works a priori, that is, within the conception of “experience” that Kant framed.

What happens when the frame breaks down as in ‘our’ passage?

A new way to look at synthesis and at certainty arises. It is a way in which synthesis has to work within the whole reality, a posteriori and not a priori. How can we represent reality and the reasoning we perform within it? I think this is a good track to explain Peirce’s tireless work on continuity. Continuity is the mathematical representation of reality and Peirce tried to work out its definition. He did not succeed but recent researches in mathematics are using his approach, vindicating his insight as more correspondent to contemporary mathematics than the analytic one (Zalamea 2009). A different look at synthesis within this conception of continuity is desirable. A first attempt has been made defining synthesis as “recognizing identity through changes” (Maddalena-Zalamea 2012). Others should follow. In any case, a new way of conceiving synthesis would open up new accounts for the rationale of human skills as hypothetic reasoning, recognition of identity, conditional predictions, and habit-taking capacity.

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86 Collateral Experience as a Prerequisite for Signification

We must distinguish between the Immediate Object . . . and the Dynamical Object, which, from the nature of things, the Sign cannot express, which it can only indicate and leave the interpreter to find out by collateral experience. (EPII: 498, 1909).

According to C. S. Peirce, collateral experience is a necessary condition for grasping relations as significant. Or formulated in the terminology of his semeiotic: when we attempt to assign attributes to objects via representamens and interpretants, collateral experience also comes into play. The concept of collateral experience is part of Peirce's late semeiotic – approximately 1896–1914 (Short 2004: 225) – but he only provided a few remarks concerning the concept. However, when the mature Peirce was preoccupied with laying down general semeiotic principles, collateral experience was also mentioned as a key idea in his terminology, e.g., in letters to fellow philosophers William James and Victoria Welby. In the following, we will try to demonstrate – roughly – how collateral experience is at work in the process of signification.

Let us begin by using an example. Looking into the horizon, we suddenly see a spot moving. We cannot see what it is, but we can see that it is something. We have a feeling of uncertainty and doubt. Is it an animal moving or an innate object moved by the wind? The spot comes closer and, given a number of physical characteristics, as well as a certain kind of behavior, we can see that it is an animal. But what kind of animal is it, we ask ourselves. Could it be a badger? No, it looks like a dog, but maybe it is a fox. The spot comes even closer and now we can see that it is, in fact, a dog. But now we begin to wonder what kind of dog it is, whether it is well-mannered or bad-tempered, and what will happen if it approaches us. The dog does approach us and now we can see that it is Jake, the dog belonging to our neighbors, and we know Jake to be a very friendly and playful dog. Hence, the spot on the horizon initiated the process of signification and, as a dynamical object, it forces itself upon the mind in perception, but includes more than perception reveals. It is an object of actual experience. The spot made us attentive, causing an emotional response in us, or an interpretant. The spot did carry some information, and we began making

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hypotheses – e.g., “It must be a dog” and later “It must be Jake”. At the first stage of the process of signification, we could make a number of possible hypotheses about the spot on the horizon; and thereby creating immediate objects, which according to Peirce, “. . . is the Object as the Sign itself represents it, and whose Being is thus dependent upon the Representation of it in the Sign, from the Dynamical Object (CP 4.536). It could be an animal, but also an innate object moved by the wind; it could be a dog, but also another member of the family *canidae*, a fox; or it could even be another species, e.g., a badger. Hence, at this stage of the process we could not really say what the dynamical object was – there were several possibilities – because we could not assign many predicates to the spot. Put in another way: the range of information was broad in terms of immediate objects that the spot could refer to. Even so, the spot did catch our attention, initiating the process – involving a dominating first act of experiencing and feeling – and the spot caused us to wonder what it was; and thereby we represented aspects of the dynamical object via immediate objects. As the spot came closer, it began to manifest itself into something that we could begin to recognize. In this phase of recognition, we abandoned (probably mostly in an unconscious manner) a series of hypotheses and we managed to identify enough predicates in order to determine that the information – the spot – concerned the shape of a dog. When the dog came even closer we could identify the spot not just as any dog, but as the neighbors’ dog, Jake. Thus, the information referred to a particular dog and the cognitive level was the dominant level – the information had been transformed into knowledge. But what happened to the concept of collateral experience? One might ask. We believe that collateral experience is operative on three different – but interrelated – levels: the emotional level, the informational level, and the cognitive level, respectively. Our premise is the following: Firstly, it is important to remember that Peirce had a broad concept of “experience”; to him experience not only relates to brute facts, but also to the total cognitive result of living, including interpretation and feeling (CP 7.538). According to Peirce, there are no other forms of consciousness besides the momentarily present content, the directly present, and the process of bringing to mind (CP 7.551). They form the system of consciousness. The momentarily present corresponds to feeling, the directly present corresponds to information, while bringing to mind corresponds to cognition. Hence, in the process of signification, collateral experience is operative at three different levels (cf. Thellefsen, Sørensen & Thellefsen 2014). But how this collateral experience works on these three levels when signification is in process remains the question. Collateral experience includes awareness of past acquaintance with things associated with the object being perceived, felt, and cognized. Furthermore, we remember that, according to Peirce, there is an intimate relation between the three types of signs – icon, index, and symbol – and the laws of association.

... signs denote what they do on the three principles of resemblance, contiguity, and causality. There can be no question that anything is a sign of whatever is associated with it ... nor can there be any doubt that any sign recalls the thing signified. So, then, the association of ideas consists in this, that a judgment occasions another judgment, of which it is the sign". (CP 5.307).

Therefore, we can assume that there is also an intimate relation between collateral experience and the three types of association – similarity, contiguity, and interest. Returning to our example, we can say that collateral experience was operative on three different levels: Association by similarity enabled us to compare the feelings caused by the object (the spot in the horizon) with feelings with which we were already acquainted (the emotional level). Association by contiguity enabled us to acknowledge a qualitative content resulting from the frequent experience of two objects together or a power from without (the informational level). And finally, association by interest enabled us to relate the two first mentioned (levels) and their objects, because of some purpose that we had in mind. We wanted to know, for example, the intentions of the dog. A conclusion may be that collateral experience is crucial for any process of signification – whether we put forth and test a hypothesis (What is the spot?) or make conclusions about a particular dog (It is the neighbor's dog Jake). This can be summarized in the following Table 1⁴.

Table 1: Elements in the process of signification

Semeiotic	Levels of signification	Breadth × Depth	Collateral experience
A spot in the horizon	Emotion (dominant) Information Knowledge	The number of predicates is low, and the number of possible immediate objects is high.	Emotional collateral experience, association by similarity.
An unspecified dog	Emotion Information (dominant) Knowledge	The number of predicates increases as the number of possible immediate objects decreases.	Informational collateral experience, association by contiguity.
Jake, the neighbor's dog	Emotion Information Knowledge (dominant)	The number of predicates is high, and the number of possible immediate objects is low.	Cognitive collateral experience, association by interest.

⁴ See Thellefsen, Thellefsen & Sørensen 2013a & 2013b for further discussions.

The first row from the left and down shows the process of signification, from the spot in the horizon – a condition of constraint, the dynamical object – to the point where we recognize the spot as Jake, the neighbors' dog. The second row shows the levels of signification as they develop from an emotionally dominant level, where the spot can refer to many things, to the level dominated by knowledge, where the spot is identified. But we have also added a third row. This stems from Peirce's early definition of information (see, e.g. Nöth 2012: 140), where Peirce defined information as $\text{breadth} \times \text{depth}$ (Peirce later named breadth and depth denotation and signification, respectively (cf., e.g. EPII: 304). This row implies that when we are uncertain of what kind of dynamical object we are experiencing, the number of predicates ascribed to the object – e.g., the spot in the horizon – will be low, while the number of possible immediate objects will be high. As the spot came closer to us, we could ascribe more predicates to the dynamical object and, as we did this, the number of hypotheses increased. Finally, when the dog stood right in front of us, we could ascribe so many predicates to the dog that we could interpret it as a particular dog, namely Jake. Consequently, when the number of predicates attributed to a dynamical object increases, the amount of information (and meaning) conveyed by it increases, as well (cf. Nöth 2012: 139). Finally, the last row implies that there are three kinds of collateral experiences: emotional, informational, and cognitional – we associate the dynamical object with feelings, information, and cognitions that we are already acquainted via similarity, contiguity, and interest. Consequently, collateral experience seems to be a fundamental element in the process of signification.

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87 Comparing Ideas: Comparational Analysis and Peirce's Phenomenology

One of the old Scotch psychologists . . . mentions, as strikingly exhibiting the disparateness of different senses, that a certain man blind from birth asked of a person of normal vision whether the color scarlet was not something like the blare of a trumpet; and the philosopher evidently expects his readers to laugh with him over the incongruity of the notion. But what he really illustrates much more strikingly is the dullness of apprehension of those who, like himself, had only the conventional education of the eighteenth century and remained wholly uncultivated in comparing ideas that in their matter are very unlike (CP 1.312, 1910).

No one doubts that visual and auditory sensations are quite “disparate”. Peirce believed that in spite of the disparateness of these two sense modalities they share something in common. As the quotation suggests, although visual and auditory sensations are very unlike in their matter, they can be (somehow) alike in their form. But how may they be alike?

Beginning in 1902 and independently of Edmund Husserl, Peirce identified a science he called phenomenology, though he would briefly rename the science ideoscopy and finally settle on phaneroscopy (from the Greek for *the observational study (-scopy) of the manifest (phanero-)*). As he initially conceived it, phenomenology would “unravel the tangled skein [of] all that in any sense appears and wind it into distinct forms” (CP 1.280, 1902). Later, he would write, “Phaneroscopy is the description of the *phaneron*; and by the *phaneron* I mean the collective total of all that is in any way or in any sense present to the mind, quite regardless of whether it corresponds to any real thing or not” (CP 1.284, 1905).

The roots of phaneroscopy are to be found in 1867's “On a New List of Categories”, for it is in that essay Peirce first identifies three categories – there identified as Quality, Relation, and Representation – based on the forms of predication. Peirce offered a Kantian justification for the categories: “This paper is based upon the theory already established, that the function of conceptions is to reduce the manifold of sensuous impressions to unity and that the validity of a conception consists in the impossibility of reducing the content of consciousness to unity without the introduction of it” (CP 1.545).

However, beginning 1896, Peirce would drop this Kantian justification for the categories. Instead, he would first establish the three categories mathematically. This mathematical basis is known as Peirce's Reduction Thesis: (1) n -adic

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relations where n is greater than three can be logically analyzed into sets of triadic relations but (2) triadic relations cannot be logically analyzed into dyadic or monadic relations. It is in 1886 that Peirce first suggests (though with clear reference to Kant) that the categories originally called Quality, Relation, and Representation might be better identified as Monadicity, Dyadicity, and Triadicity or as Firstness, Secondness, and Thirdness. More shall be said about these categories momentarily.

After establishing the categories mathematically, Peirce would then invite the reader or listener to study the phenomena (or the phaneron). In 1896, he effects the transition thusly: “if there are really any such necessary characteristics of mathematical hypotheses as I have just declared in advance that we shall find that there [are], this necessity must spring from some truth so broad as to hold not only for the universe we know but for every world that poet could create. And this truth like every truth must come to us by the way of experience. No apriorist ever denied that” (CP 1.417). In other words, since Peirce’s Reduction Thesis expresses a necessary truth and since its truth must have first been suggested to us in experience, we ought to find in the phenomena themselves Firsts, Seconds, and Thirds. Later yet, Peirce would simply invite us to “turn to the phaneron and see what we find in fact” (CP 1.299, 1905).

What are we looking for when we investigate the phaneron for First, Seconds, and Thirds? A grammatical parallelism is helpful (see EPII: 172). Consider the following three sentences with blank subjects:

- (1) ___ is red.
- (2) ___ sees ___.
- (3) ___ represents ___ to ___.

“Is red” is a First because it is a one-place relation; it takes only one subject. “Sees” is a Second because it is a two-place relation. “Represents to” is a Third because it is a three-place relation. In like manner, we want to know whether there are features of the phaneron that are what they are (1) independently of relating two or more things, (2) in virtue of relating two things and only two things, and (3) in virtue of relating three things.

Peirce thinks there are. As to (1), qualities are Firsts. They are possibilities that may inhere in distinct subjects, e.g. both a ball and a medicine might be scarlet red. As to (2), conscious experiences are Seconds – e.g. when I see a scarlet red. Such experiences are reactions between an ego and a non-ego, a subject and an object (understood as a *Gegenstand*, something that stands against consciousness regardless of its reality). Finally, as to (3), perceptual judgments are Thirds. Roughly, they represent a percept to a thinker.

Here we glimpse some respects in which a scarlet red and a trumpet's blare are alike. They are both qualities, Firsts. Just as many different objects may be scarlet red, so also many different trumpets may blare. Moreover, just as seeing is a two-place reactive relation, so is hearing. Finally, we make judgments about our perceptions: "the ball is scarlet"; "the trumpet is blaring".

However, these do not seem to be the relevant respects in which Peirce thinks seeing a scarlet red is like hearing a trumpet's blare. In order to see why, simply consider the fact that *vaguely remembering touching a cotton swab* has these features of Firstness, Secondness, and Thirdness, too. Yet, it seems patently absurd to say that hearing a trumpet's blare is like vaguely remembering touching a cotton swab. What, then, is missing from the present account? What makes seeing a scarlet red like hearing a trumpet's blare but both of those unlike vaguely remembering touching a cotton swab? Answering those questions requires a brief survey of how Peirce's thought developed from 1903 to 1910.

In 1903, Peirce suffered a crisis of faith in his categories, not mathematically but as they relate to the phaneron. In a deleted passage from the Harvard lectures, delivered March – May, 1903, he writes, "if I were asked today which of the two propositions, that the three categories are Quality, Relation, and Representation (to use my terminology of [1867]) or that the three forms of inference are Hypothesis, Induction, and Deduction, which of those two seemed today to be most fully supported by evidence, I should say the latter" (Peirce, 1997, 276n3). Why such hesitation as pertains to the categories?

Peirce's crisis of faith is precipitated by the realization that, on the one hand, qualities are supposed to be simple, monadic and unanalyzable, but, on the other hand, they are themselves composed of qualities. There are qualities, but there are also qualities of qualities. The problem is most evident in a draft from the third of his Lowell lectures, delivered November – December, 1903. Peirce begins by writing,

[A] there are elements of what is before the mind which do not depend upon others, each of them being such as it is positively, in itself, regardless of anything else. Such, for example, is the quality of purple.... [T]he quality of the purple remains the same, peculiar and positive; and we can only say of it that it is such as it is (MS 646.23, see also EPII: 268).

However, in the very same manuscript he writes,

[B] Characters themselves have characters. Thus, "being of an ultramarine blue" has the characters of ... being intensely chromatic, of having a low luminosity, etc. (MS 646.44).

The problem is obvious: according to the first quotation we can only say of a quality that it is such as it is but according to the second quotation we can analyze a color quality into its chroma and luminosity. So, are qualities like purple, which are supposed to be Firsts, simple and unanalyzable elements of the phaneron? Or are they analyzable elements of the phaneron and so not Firsts?

1907s “An Apology for Pragmatism” presents precisely the second point above – that colors themselves are analyzable in terms of their hue, chroma, and luminosity – as an objection to the claim that “a feeling of redness or of purple without beginning, end, or change; or an eternally sounding and unvarying railway whistle . . . should constitute the entire universe” (CP 1.305). They could not constitute the entire universe, the objection goes, because “each would have a quality, which would be a determination in several respects, the color in hue, luminosity, chroma, and vividness; the sound in pitch, timbre (itself highly complex), loudness, and vividness” (CP 1.305). Yet, if Peirce’s theory that qualities like purple are Firsts is true, then it ought to be possible that such a feeling of purple could constitute the entire universe.

Peirce’s reply to this objection is that “these things [chroma, hue, luminosity, vividness; pitch, timbre, loudness, vividness] are known to us by extraneous experience; none of them are either seen in the color, heard in the sound” (CP 1.305, see also MS 908.13, n.d., MS 296.57, 1908, and MS 645.27, 1910). For Peirce, what is at stake is the kind of analysis involved. Qualities like purple are Firsts because they are “logically indecomposable, or indecomposable to direct inspection” (CP 1.288). However, even if Firsts are not analyzable logically or by *direct* inspection, it does not follow that they are not subject to “comparational analysis by which we perceive likeness of different feelings” (MS 339.551). This is the sort of analysis involved in distinguishing among the hue, luminosity, and chroma of a color or among the pitch, timbre, and loudness of a sound. It is a kind of *indirect* inspection that involves “extraneous experience” used to make a comparison.

My aim here is not to develop or defend Peirce’s solution to the problem evidenced in his comments of 1903; rather, it is show how Peirce’s “discovery” of comparational analysis as a result of countenancing that problem enables him to describe how seeing a scarlet red is like hearing a trumpet’s blare. In order to fully appreciate his comparational analysis, two more quotations are needed:

As to Feeling, by which I mean Qualities of Sensation and other Passions, I remark that most persons, David Hume, for example, reckon as one kind of ingredient of it a certain Prebit [or element] which seems to me to form no part of Feeling. I mean the *Vividness* of a Feeling. For Feeling is a Quality and though it certainly has [E] two Quantities connected with it, its [D] total intensity and [C] the relative intensity of its leading ingredient, both being Quantities of Quality, [H] I do not recognize *Vividness* as the Quantity of a Quality of predicate at all, but simply as a non-relative or non-predicative Quantity. . . . It is a *force*. (MS 645, 1910).

In truth, all consciousness is *ipso facto* Secondness. I have sometimes called Qualities of Feelings immediate consciousness; but this immediate consciousness is a fiction of the psychologists. Consider your memory or imagination of a red color. [F] You may have a very dim imagination of a brilliant scarlet. You may have an intensely vivid imagination of an ashen rose color, or a very dull reddish grey. The vividness or dimness of the image does not affect the quality. [G] The vividness is the force of the reaction upon you of the object of imagination. It is of the nature of compulsion, or Secondness. . . . The quality *per se* has no vividness or dimness. (MS 465.9–11, 1903).

We are now in a position to summarize how seeing a scarlet red and hearing a trumpet's blare are alike (I have already called these points out in the previous quotations by using corresponding letters in brackets):

- [A] Both the scarlet red and the trumpet's blare are Firsts, qualities.
- [B] Yet those Firsts themselves have qualities, the qualities of qualities. For colors, they are hue, chroma, and luminosity. For sounds, they are pitch, timbre, and loudness.
- [C] Each of these qualities of qualities itself has an intensity. Scarlet reds are highly luminous (are bright), highly chromatic (strongly deviate from grey; now: colorfulness), and have an "intense" (now: unique) hue (in contrast, a color like purple deviates from the unique hues red and blue). Likewise, trumpet blares are highly pitched, very loud, and have a unique timbre (a property still not well understood). These are the relative intensities.
- [D] Qualities themselves have a total intensity, which is a function of its relative intensities. Scarlet reds and trumpet blares have high relative intensities and so have high total intensities.
- [E] Thus, qualities of qualities and qualities themselves have quantities of qualities, which is their degree of intensity (whether relative or total).
- [F] Nevertheless, the vividness of seeing a scarlet red or of hearing a trumpet's blare is not a quality of the qualities *scarlet red* or *trumpet blare*. That this is so is evidenced from the fact that both a remembered scarlet red and a seen scarlet red have a high total intensity but the latter is much more vivid than the former. The same can be said of remembering as opposed to hearing a trumpet's blare. Similarly, we can have vivid feelings of colors with low intensity and dim feelings of colors with high intensities.
- [G] Rather, vividness is the force of the reaction of the object, the non-ego, upon the subject, the ego.
- [H] As such, vividness also comes in degrees, a quantity. However, it is a not degree of a quantity of a quality but, following from [G], a degree of force of the non-ego on the ego. As Peirce writes, "Vividness must, therefore, be the intenseness of the immediate consciousness of the action of some psychical-brute force produced by, or along with, every feeling" (MS 298.68, 1905; on

this point, see also Peirce's discussions of struggle and *quietus* at EPII.150–51, 1903, and of externisensation at MS 339.496, 1905). As both the scarlet red and the trumpet's blare are perceived (presumably under normal conditions) rather than (e.g.) dreamed, they have a high degree of vividness.

Moreover, we are now in a position to see how seeing a scarlet red and hearing a trumpet's blare are like and unlike vaguely remembering touching a cotton swab:

- [A] All three – the scarlet red, the trumpet's blare, and the tactile quality of feeling the cotton swab – are qualities, Firsts.
- [B] All three have qualities of qualities. Tactile qualities involve temperature, hardness, and roughness as qualities of qualities.
- [C] However, whereas the qualities of qualities of seeing a scarlet red and of hearing a trumpet's blare have high relative intensities, the qualities of the tactile quality of feeling a cotton swab have low relative intensities. The swab is (in your memory) room temperature, not hard, and not rough.
- [D] The total intensity of the tactile quality of touching a cotton swab is a function of its relative intensities, just as it is for a scarlet red or a trumpet's blare. Hence, the tactile quality of the cotton swab has a low total intensity.
- [E] Insofar as these qualities have some degree of intensity, that have quantities associated with them, quantities of qualities. This is the degree of intensity of the quality.
- [F] Moreover, all of the qualities have some degree of vividness insofar as they felt (seen, heard, remembered) at all: "every feeling, I say, has some degree of vividness. Absolute faintness implies the absence of the feeling" (MS 298.65, 1905).
- [G] Once again, the vividness of all three experiences consists in the force of the non-ego upon the ego.
- [H] However, in a vague memory, that force is quite low (the *Gegenstand* of a distant memory does not press itself forcefully on the ego) whereas in perceptions it is very high. For this reason, the vague memory of touching the cotton swab is less vivid than the perceptions of seeing a scarlet red and of hearing a trumpet's blare.

I conclude with a comment related to future research: if Peirce's work in comparative analysis is sound, then we ought to be able to extend it in such a way that we could compare and describe all sorts of experiences. In "What is it like to be a bat?" Thomas Nagel (1974) challenges us to develop an objective phenomenological *vocabulary* that can *describe* what it is like to be a bat (which

does not require imparting bat-like experiences). He also suggests that we start by developing a vocabulary that can describe to a man born blind what it is like to see color. [A]–[H] show Peirce made progress in accomplishing the latter task. Perhaps, then, we can make progress in accomplishing the former.

For more on these and other issues related to Peirce's phenomenology, see also: Atkins forthcoming a, forthcoming b, 2013, 2012, and 2010.

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88 Developing from Peirce's Late Semeiotic Realism

... if, for example, there be a certain fossil fish, certain observations upon which, made by a skilled paleontologist, and taken in connection with chemical analyses of the bones and of the rock in which they were embedded, will one day furnish that paleontologist with the keystone of an argumentative arch upon which he will securely erect a solid proof of a conclusion of great importance, then, in my view, in the true logical sense, that thought has already all the reality it ever will have, although as yet the quarries have not been opened that will enable human minds to perform that reasoning. For the fish is there, and the actual composition of the stone already in fact determines what the chemist and the paleontologists will one day read in them. . . . It is, therefore, true, in the logician's sense of the words, although not in that of the psychologist's, that the thought is already expressed there (EPII: 455, 1911).

The above fragment was taken from an unfinished manuscript of August 1911, written probably to be part of a collection of essays in honor of Lady Welby, which was actually never published. Peirce gives us here an interesting example of his mature semeiotic realism and how it can be linked to his strict version of pragmatism. For a period of time, Peirce even renames his method to clarify ideas as *pragmaticism* to differentiate it from the meaning he blames William James and Schiller to have turned pragmatism: “‘the will to believe’, the mutability of truth, the soundness of Zeno’s refutation of motion, and pluralism generally” (EPII: 457).

In the work from which this excerpt was selected (*A Sketch of Logical Critics*), Peirce was chiefly concerned about the definition for *Logical Critics* and its place in his general classification of sciences. Nevertheless, as he develops his argumentation we are offered a concise and interesting schema of how his various doctrines might be connected within his mature thought. The example of the fossil fish might then be taken as an illustration of how *pragmaticism* and *semeiotic* are welded together, which means to solve the Kantian challenge of how synthetic judgments *a priori* are possible – a question that Peirce generalizes as “How are universal propositions relating to experience to be justified?” (CP 4.92). Taking advantage of the above quote, the question might be rephrased as How is it possible that the conclusion taken by the skilled paleontologist upon observation of the fossil fish might be accepted as a sufficiently universal

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knowledge as to influence our future conduct on paleontological inquiry and science in general?

Let's start then by recalling that in Peirce's pragmatism the real is considered that which would be represented in the true opinion, or final interpretant, held by an ideal community of inquirers having all the necessary time and resources to carry the investigation in the right direction. To be sure, the real is unconditioned since its predicates are true regardless of what any actual person or persons might think concerning it. Nevertheless, truth itself is conditioned because its very nature is of a conditional proposition never completely fulfilled. This implies that the common mental habit or belief held by any particular community of interpreters is always subject to further revision and improvement, which sooner or later shall happen as novelty pops up in the scene. No actual determination can ever exhaust what is vague and indefinite, which means that:

... of things of which we rightly but vaguely believe, the immense majority are similarly unknown; and this majority grows relatively (and not merely numerically) larger the further inquiry is pushed, and we cannot, in any sense, look forward to a state of things in which such beliefs as that any stone let fall from the hand would drop to the earth are to be replaced by such a knowledge as that every stone that has been let loose has dropped (EPII: 457).

The final interpretant of a conditional proposition is not a definite habit then (as Peirce advocated earlier in his writings), but the very habit-change that must take place as new information is gathered in the process of semeiosis, leading to more complex, varied and multilayered reality. Here we have in a nutshell the consequences of the three most important doctrines Peirce regarded as fundamental to his late pragmatism: synechism, or the doctrine of the continuum as the prime law of reality; tychism, or the doctrine of chance as responsible for feelings and novelty that produce differentiation; and falibilism, or the humble attitude of regarding every belief as provisory, and never declaring to have the final knowledge about anything. From these doctrines, synechism is the central one because the other two might be taken as corollaries of it. So let's see how Peirce defines it:

Synechism is founded on the notion that the coalescence, the becoming continuous, the becoming governed by laws, the becoming instinct with general ideas, are but phases of one and the same process of the growth of reasonableness. This is first shown to be true with mathematical exactitude in the field of logic, and is thence inferred to hold good metaphysically (Peirce 1998: 302).

The essence of synechism is indeed the metaphysical consequence of accepting the real as thinking, as representing, so that "all the logical relations are

repeated as metaphysical relations” (MS L 75) Peirce explains that our amazing ability to guess the laws of nature is grounded in this very connaturality between our human mind and the universal mind. The universe is what we are conscious of – and we can think about it only because its very essence is that of being thought of. This also implies that the universe is sentient and alive, because there can be no thought without sensations produced by feelings:

Now, in obedience to the principle, or maxim, of continuity, that we ought to assume things to be continuous as far as we can, it has been urged that we ought to suppose a continuity between the characters of mind and matter, so that matter would be nothing but mind that had such indurated habits as to cause it to act with a peculiarly high degree of mechanical regularity, or routine. Supposing this to be the case, the reaction between mind and matter would be of no essentially different kind from the action between parts of mind that are in continuous union, and would thus come directly under the great law of mental association, just as the theory last mentioned makes sensation to do (CP 6.277).

This quotation must be fully understood. We learn here that sensation works by the law of mental association as much as reaction between mind and matter. Following Peirce's own definition, a sensation is a simple predicate taken in place of a complex predicate; in other words, it fulfills the function of an hypothesis, synthetizing the continuous multitude of feelings into a simpler one. Returning to the Kantian riddle, how is this fundamental synthesis possible? Peirce's answer is that “the mind works by final causation, and final causation is logical causation” (CP 1.250). If we want to understand how a paleontologist might get the necessary information from a fossil fish as to correctly reason towards an important conclusion, we must understand how logical causation, or better, semeiotic causation, works linking sensation (which is a key component of experience) to critical reasoning based on propositions.

We know that a proposition is a symbol endowed with the power to produce an interpretant of the nature of a mental habit, or belief. By its turn, a symbol is a general sign that lives in its replicas, which are its instantiations. That's how symbols become active thinking operating in the real. Replicas have indexes as bones and symbols as flesh, but there is another important element: its soul, which is of the nature of an icon. Not a pure icon that cannot be distinguished from the dynamic object (EPII: 163), but symbolic icon, or metaphor, made of layers of possible meanings. Here we get to the very bottom of the semeiotic process, for an icon living inside a symbol is this general idea that allows some identity of form, always metaphoric, between the sign and its object. This associative power grants the continuity of form between the symbol and its dynamic object, wrapping them together.

It is usually said that a proposition is a conjunction, or syntax, between a subject (or complex of subjects) and a predicate. Applying what we have learned

so far, the subjects of a proposition are all those indexes that denote cognitions accumulated in its process of development – a growth that happens whenever the proposition is actively replicated in a particular situation. In the proposition “Cain killed Abel”, for instance, the subjects are not only Cain and Abel, but also the act of killing and that consequence of being killed. They have been learned by the “out clash” or brute force of experience, made general due to the schema of time and now put together by the law of association. One may ask, then, what is left as the predicate of the whole proposition and waits to be judged true or false? Peirce himself answers:

Nothing, but the flow of causation. It is true that we are made acquainted even with that in Experiences. When we see a baby in its cradle bending its arms this way and that, while a smile of exultation plays upon its features, it is making acquaintances with the flow of causation. So acquaintances with the flow of causation so early as to make it familiar before speech is so far acquired that an assertion can be syntactically framed as it is embodied in the syntax of every tongue. However, it is not because of this physiological fact, that it becomes proper to draw the line between Subjects and Predicates here; neither is it because of the psychical fact that human minds naturally think in a way broadly (i.e a little) similar to the forms of syntax; nor is it even because of the metaphysical truth, that “the order of syntax is the law of Time and of Becoming”. This is proved by the facts, first, that it is necessary that Reasoning by which we discover and defend the order of Causation, of human thought, of time, of becoming, themselves presuppose the recognition of the corresponding order in syntax; and secondly, by this, that it has not been Time, or Causation, or the structures of the human mind, nor human anatomy and physiology that have, any or all of them, determined that that ought to be the order of syntax that in fact ought to be so, but precisely the contrary, it is the fact that the order of Syntax ought to be as in fact it ought to be that has determined the fact, Real Being, and Time to take the same form, and then that it should become natural to the mind and should be the pattern of physical action. (MS 664).

At this point we are ready to apply Peirce’s late semeiotic realism to the example of the knowledge gathered by the paleontologist from the fossil fish. The scientific reasoning would not have any possible assurance if the paleontologist, at a very early stage of his life, would not have internalized the order of syntax that governs the laws of nature, the very law of mind or causation, the schema of time which transforms the possible into the universal. The fossil fish, the rocks, the place they were found, the chemical elements associated to place of the finding are all possible subjects of a conditional proposition that has the power to unite these indicated subjects in the general form of an idea, or diagram, thanks to syntax, or fact that is not accidental to the human anatomy, but the expression of the very law of causation that governs both human minds and the universe considered as thinking. Our beliefs are bent towards the laws of nature because both are in continuous association through the flow of causation that produces moving metaphors that wrap our experience in layers of meaning.

The thought expressed by the fossil fish might never be part of thinking if it is not found by a skilled paleontologist. But it is nevertheless a real *might be*, and this suffices to be a sign. When a particular paleontologist actually observes it, he produces perceptual judgments. These are sensations that synthesize all the multitude of complex predicates gathered from observation into a simpler hypothetical conception. This seminal symbol has the power to grow as further determinations produced by reasoning bring out a narrative of how that fossil fish might have been formed in nature. This narrative is deduced from the original hypothesis, and many facts expressed by it can be tested and eventually falsified or corroborated. Laboratorial analysis of the chemical components and other collateral procedures produce the inductive proof for a line of argumentation.

Semeiotically, the fossil fish is a sign that would represent its object (the real nature of how it was formed) to a particular interpreter, the skilled paleontologist. Being a thought, it is at least a legisign and so must have the power to produce a general final interpretant, or belief, if the paleontologist so carries the inquiry. But to recognize the fossil fish as a sign in the first place, the paleontologist must indeed be a skilled one – that is, he must have the necessary familiarity to what such a fossil might mean, given by his previous experiences (lessons in school, training in field research, debates and conferences with colleagues, etc.). This means that he must be capable, by what Peirce calls collateral experience, to create a mental diagram that embodies the meaning of a general predicate (EPII: 303). This diagram is the immediate object of a symbol, and the form it embodies is the “idea” which grounds the concept that the paleontologist is developing about the fossil fish. So:

A concept is the living influence upon us of a *diagram*, or *icon*, with whose several parts are connected in thought an equal number of feelings or ideas. The law of mind is that feelings and ideas attach themselves in thought so as to form systems. (CP 7467).

The immediate interpretant is all possible general sensations the paleontologist would be able to have (once again, granted that he is skilled and prepared to interpret such a fossil). The dynamic interpretants are those determinations that the sign effectively produces in the mind of the paleontologist, carrying the inquiry in this or that direction (but not in all directions that would be possible by the general immediate interpretant, for, as we have seen, no determination ever exhausts what is essentially vague and indefinite). The final interpretant would be all lessons to be learned from the fossil fish not only by a paleontologist in particular, nor by any number of scientists, but by every conceivable scientific mind.

There is more to it, though. The symbol that the paleontologist develops in his consciousness as he embodies the form of the dynamic object must have the

habitual garment of a language shared by the community of scientists or else it could not serve as a medium for the communication of the form expressed by the fossil fish (and this form is the dynamic object of the symbol being considered). Let's suppose it is a paper written in English, announcing the discovery. The whole paper is a symbol. It must have a sort of habitual relation to the form it diagrammatically presents in its assertions, and the community of scientists must be skilled in the syntax embodied by such paper, that is, there must be a habit of producing dynamic interpretants relating to these kinds of papers in the community of interpreters. Otherwise, there would be no use in writing a paper about anything, for it would be unintelligible. And there must also be a general tendency of producing a final opinion about what the symbol represents, which is the expected shared understanding of what is meant by the paper.

Finally, there must be habit of effectively producing dynamic meanings due to what the paper communicates, that is, the collection of all particular opinions about the paper that any one colleague, or definite number of colleagues united as groups, would produce as the interpretative result of getting the information represented by the paper. Some might agree, others disagree, about what is being said, so the last stage of inquiry would be that final opinion that all paleontologists, and ultimately all scientific intelligence would achieve, if in contact with the information being expressed by that symbol. This would be the end of inquiry, but we already know from what has been said in the very beginning of *this* paper that such end is not attainable, for there must always be left out some possibilities, vague and indefinite, that might ultimately lead to further developments.

The normative science of Aesthetics, as the science that studies how qualitative changes in our beliefs might influence our future conduct, must then be acknowledge as the womb of Logical Critics, for without it we could become hostages of our own cocksureness. In Aesthetics lies the uberty of thought, but only as much as this creative power is grounded in a deep instinct to capture the admirable relations that hold the real as meaningful. If the paleontologist would not find the fossil fish admirable, maybe even to bring him to a state of ecstasy before his finding, he would never feel the pleasure of such discovery as to dedicate all the time and resources he disposes to act as to open the quarries "that will enable human minds to perform that reasoning", which must be a conduct guided by Ethics. We see then how Aesthetic, Ethic and Logic are intertwined in the continuous pursuit of the truth.

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Index

- Abduction 35, 71, 103–104, 106, 111–112, 162, 179–180, 186, 189, 215, 259–261, 266, 276, 284, 301, 306, 325–329, 349, 353–357, 365–371, 383, 389, 413, 471, 495, 497, 501, 505–506, 551
- Retroduction 177–181, 185–186, 235, 353–354, 366
- Aristotle v, 33, 38, 77, 120, 123, 202, 205, 208, 213, 215, 236, 325, 327, 353–354, 374–375, 430, 433, 462, 475, 505, 549
- Aristotelian 74, 202, 212, 224, 226, 353, 460
- Assertion 15, 23, 53, 55, 117–118, 130–135, 196, 268, 318, 320, 336, 381, 483, 538, 551, 553, 572, 574
- Belief 14, 27–30, 44, 48–52, 54–61, 63, 74–75, 104, 107, 110–111, 169, 171–172, 215–216, 219, 229, 232, 240–243, 306, 309–310, 328, 330, 332–333, 335, 348, 350, 355–357, 379, 381–383, 400–401, 421–426, 466, 470, 472, 477–478, 483, 524, 537–542, 570–574
- Fixation of belief 25, 40, 42, 52, 57, 63–64, 139, 190, 277, 325, 355, 390, 400, 421, 423, 452, 466, 470, 480, 538–539, 542, 533, 570
 - Religious belief 1, 4, 188–191, 222–224, 515–517, 519, 523, 526
- Berkeley, George 13, 15–17, 33–40, 44, 149, 280, 400, 475
- Biosemiotics 88–89, 92, 261
- Brent, Joseph xiv, 2–3, 48, 141–142, 208, 211, 230, 375, 407, 409, 437
- Categories 15, 17, 23, 82–83, 86, 93, 95, 98, 103, 106, 177, 181–182, 185, 193–194, 196, 207, 209, 237, 240, 269, 276, 299, 327, 331, 333, 339, 341–342, 375–376, 378, 380–381, 407, 418–419, 430–431, 433, 471, 485, 508, 522–523, 527, 538, 548, 550, 560, 562–563
- Classes of signs 263, 289, 408, 419, 485–486, 507–508, 511–512, 527, 532, 535
- Classification of the sciences 119, 263, 291, 297, 299, 347, 421, 425, 438, 484, 569
- Classification of signs 97, 261, 267, 287, 408, 462, 484, 498, 507, 527–535
- Clearness 28, 169–175, 407, 425, 475, 524
- Cognition 6–7, 10, 15–17, 21, 24, 27, 30, 33, 35, 41, 82, 95, 101, 104, 109–110, 117, 122–125, 155, 159, 161, 163, 171, 193–196, 198–199, 246, 261–262, 283–285, 288, 309, 318, 322, 328, 353, 370–371, 373, 402–403, 434, 446, 494, 496–498, 514–515, 519, 558, 560, 572
- Cognition series 13, 15, 27–28
- Common sense 48, 60, 149, 187, 258, 315, 323, 377, 396, 400–401, 421, 423–426, 433, 465–466, 468, 472–473
- Communication 8, 10–11, 17, 41, 45–50, 76, 96, 104, 132, 167, 210, 283, 287, 403, 440–441, 446, 457, 548, 551
- Community 37–39, 41–43, 63, 68, 70, 73, 76–79, 105, 142–143, 166–167, 188, 191, 217, 280, 293, 309–311, 403, 440–441, 548, 570
- Concrete reasonableness 15, 277, 279, 281, 334, 403, 490, 519, 525, 555
- Conduct 59, 179, 182, 218–219, 239, 243, 276–277, 279, 306, 312, 347, 349, 399, 406, 524, 526, 537, 541, 574
- Consciousness 6, 9, 13, 16, 22–23, 27, 38, 81–86, 134, 158, 182, 194–195, 301–303, 328, 374–375, 377, 413, 445–446, 448, 504–505, 514, 517, 545–548, 555, 558, 561, 565, 573
- Double consciousness 194, 328, 374–376, 411
 - Immediate consciousness 158, 546–547, 565
 - Self-consciousness 9–10, 15, 22–23, 110, 158–159, 165, 406, 411
- Continuity 9–11, 34–35, 44, 63–65, 69, 90–91, 107–108, 113, 124, 158–159, 180–181, 210–211, 236, 377, 280, 396, 401–402, 432, 459–460, 463, 513, 517, 519, 550, 556, 571

- Cosmology 6, 35, 90, 107, 148, 161, 208,
212, 430, 453, 455–456, 516–518
- Critic 202, 268–269, 351, 507
- Darwin, Charles 54, 145–152
- Deduction 66, 88, 103–104, 109, 111–113,
162, 180, 260, 276, 349, 356–357, 366,
389, 471, 497, 501, 549, 563
- Descartes, René 27, 29–31, 106, 149, 169,
177–178, 181, 224, 280, 297–298
- Dewey, John 82, 86, 140, 277, 306, 315,
422–423, 426–427, 467, 477–478
- Diagram 115–120, 129, 133, 192, 194–195,
198, 199, 235, 263, 265, 276, 284, 288,
295–296, 339, 342–343, 345, 360, 362,
413, 483–486, 493–501, 509, 527–535,
572–574
- Division of signs 82, 340, 360, 507, 527
- Doubt 27–31, 45, 49–50, 53, 57, 59–65, 70,
73, 75, 106, 110–111, 149, 169, 171–172,
188, 191, 223, 335, 348, 350, 355–357,
421, 432, 470, 525, 537–542
- Duns Scotus 35, 162, 194, 268, 465
- Dynamic Object 196, 269, 342, 485–486,
551, 571, 573–574
- Dynamical object 93, 106, 257, 444, 510–
511, 515, 545–546, 548, 557–558, 560
- Ego 23, 165, 247, 328, 374, 376, 403, 547,
555, 562, 565–566
- Epistemology 25, 28, 39, 41, 86, 240, 276,
296, 298, 305, 325, 401, 432, 434
- Error 10, 12, 15, 22, 112, 166, 205, 249, 280,
296, 300, 328–329, 439–440, 463
- Esthetics 3, 187–189, 218, 259–262, 271,
279–281, 300, 350, 381, 413, 421, 425–
426, 515, 519, 525, 541, 555, 574
- Ethics 3, 40–41, 43–44, 74, 77, 173, 183,
188, 217–218, 260, 271–277, 281, 198,
300, 309, 311–313, 334, 348–350, 359,
379, 411, 413, 421, 425, 504, 541, 555,
574
- Existential graph 116, 128, 229, 242, 292,
483, 493, 495, 500
- Experience 9, 14–15, 18, 21–22, 26, 29, 36,
53–54, 58, 60–61, 68–69, 82–83, 90,
100, 108, 110–112, 134, 156, 165, 184,
190, 194, 203, 216, 224, 226–227, 232–
234, 241, 269, 374–276, 300–301, 319,
323, 325, 327–329, 333, 350, 373–378,
380, –382, 389–390, 394, 401–403,
407, 415, 424–426, 432, 461, 465, 468,
479, 487, 489–490, 508, 515–516,
523–524, 540–542, 546–551, 555, 557–
560, 562, 564, 566, 569, 571–573
– Collateral experience 545–548, 557–560,
573
- Faith 15, 19, 71, 73, 76–79, 105, 435, 516,
518
- Fallibilism 15, 21, 90, 92, 105–110, 113, 119,
137, 149, 177–178, 180–181, 185, 229,
233, 250, 317–318, 322, 399, 402, 439
- Fisch, Max xi, xiii, 13, 41, 196, 401, 430–
431, 434–435, 438, 469, 496
- Firstness 34, 82, 93, 95, 98–99, 106, 129,
183–184, 208, 212, 235, 237–238, 258,
299, 327, 333, 339, 341–343, 367–368,
375–377, 381–382, 407–408, 418,
431–433, 484, 519, 522–523, 538, 562–
563
- God 2–4, 36–37, 54, 77, 148, 187, 189–191,
209, 211–212, 224, 318, 320, 408, 454,
478–480, 490, 513–519, 521, 523–524,
526
- Guess at the riddle v, 153–154, 193–194,
198, 470
- Habit 22, 28, 39, 55, 59, 77, 83, 87, 94, 110,
123, 149–154, 162–163, 167, 208, 212,
216, 232, 247, 287, 309, 321, 323, 366,
375, 377–378, 381, 413, 421, 423–424,
426, 455–456, 459, 462–463, 485, 510,
519, 527, 539–541, 546, 550, 570–571,
574
- Hegel, G.W.F v, 3, 207, 209, 325–327, 329,
375, 381, 429–435
- How To Make Our Ideas Clear 27, 40, 63,
68–69, 73, 169–170, 326, 400, 423,
452, 472, 480, 487, 525, 563
- Hope 15–16, 19, 67–68, 70–71, 73, 77, 142,
166, 375, 310, 377, 439, 451

- Hume, David 22, 305–306, 326, 400, 460, 564
- Hypothesis 23, 37, 49, 54, 56, 58–61, 66, 90, 106, 108–109, 111–112, 121–122, 147, 162, 179–180, 190, 215–217, 239, 266, 301, 321, 353–354, 356, 365–366, 375, 433, 505, 521–522, 537, 539, 549–550, 563, 571
- Icon 81, 96, 99–103, 120, 127–135, 198–199, 254, 257, 265–266, 284–285, 340–343, 351, 359, 360, 382, 483–484, 486, 496, 558, 571, 573
- Hypoicon 339–345, 360–362, 483–486, 504
- Iconicity 82, 117, 129–130, 132, 135, 285, 287–288, 345, 362, 494, 496
- Idealism 3, 36, 94, 149, 208–209, 323, 325–327, 429, 432–433, 459, 476, 554
- Identity 5–6, 8–11, 15, 43, 70, 119, 158, 165, 210, 241–242, 297, 341, 394–396, 445, 447
- Image 6, 13, 27, 81, 115, 128–129, 132–135, 199, 236, 257, 284, 339, 341–343, 345, 359–360, 362, 401, 406, 484–486, 495, 498–499, 504, 509, 565
- Immediate Object 17, 106, 269, 485, 508–511, 515, 545–546, 548, 557–560, 573
- Immortality 6, 8, 299, 396, 432
- Index vi, 96, 99, 105, 132–135, 199, 252–256, 258, 265, 268, 276, 285, 340, 342, 359, 382, 527, 558, 571–572
- Indexicality 82, 85–86, 100, 103–104, 132, 132, 135, 258
- Induction 66, 103–104, 109, 111–113, 149, 162, 179–180, 184–185, 215–216, 260, 273, 276, 289, 305, 349, 353–357, 366367, 471, 506, 549, 551, 563
- Inference 4, 6, 8, 25, 64–68, 70, 74–76, 81, 103–108, 110–112, 157, 162, 179–182, 201–203, 241, 250, 259–261, 284, 289, 296, 316, 323, 326, 333, 346–348, 353–355, 357, 364, 366–370, 388–389, 413, 425, 470, 497, 505–506, 528, 537, 540, 548–549, 563
- Information 7, 50, 96, 100–101, 103, 116, 132–133, 135, 185, 301, 310, 336, 361, 448, 495, 499, 501, 558–560, 570–571
- Inquiry 19, 29–30, 42–43, 45, 48–51, 53, 57–58, 60–62, 65, 67, 71, 73, 75–79, 105–107, 109, 111–113, 117, 119, 152, 162, 171–173, 179, 185, 187–191, 214–219, 229, 231–233, 257, 274–275, 298, 306, 309–311, 321–323, 326, 328, 335, 337–338, 348, 355, 357, 366–368, 373, 380–381, 385, 388–390, 403, 452–453, 466–467, 470, 476, 487, 489, 509, 517, 525, 537–540, 554, 570, 574
- Scientific inquiry 42–43, 58, 105, 111, 113, 152, 187–188, 190, 214–216, 219, 309–310, 321, 356, 438, 441, 537–538
- Instinct 188–189, 245–247, 249–251, 274, 320, 323, 333, 365, 367–371, 383, 413, 486, 516, 570, 574
- Interpretant 7, 10, 17, 23, 93, 95–100, 103, 118, 129–130, 133, 136, 156, 161, 163, 167, 238, 255–256, 261, 263, 268–269, 272–273, 276–277, 283, 285, 287, 317, 341–342, 360, 380, 407, 413, 416, 430–431, 444–446, 486, 509, 511, 522, 527, 532, 545–546, 555, 557, 571
- Final Interpretant 238, 273, 445, 486, 511, 570, 573
- Intuition 21, 23–25, 109–110, 149, 170, 193–194, 196–198, 296, 326, 348, 412, 554
- James, William 14, 17, 19, 41–42, 44, 54–55, 81–82, 84–85, 140, 170–171, 173–174, 211, 213, 230, 234, 268, 271, 273, 283, 306, 315, 317, 321, 331–334, 373, 375, 379–380, 383, 396, 399–400, 431, 437–438, 443, 472, 475–481, 505, 514, 524–525, 542, 557, 569
- Kant, Immanuel 23, 25, 174–175, 207, 225, 259–262, 280, 305, 319, 325–327, 329, 354, 400, 430, 432, 460, 475, 540, 553–555, 562
- Kantian 23, 42, 174, 193, 259, 319, 322, 325–326, 353–354, 378, 460, 503, 540, 553–554, 561, 569, 571
- Lady Victoria Welby vi, xi, xiii, 69, 84, 167, 264, 273, 405, 407–408, 415, 426, 507, 523, 557, 569

- Law of mind 13, 66, 89, 123, 127–129, 148, 150, 161–162, 208, 374, 460, 462–463, 517, 572–573
- Legisign 99–101, 103, 261, 341, 485, 509–510, 573
- Leibniz, Gottfried Wilhelm von 169, 205, 224, 393, 432
- Locke, John 35, 38, 280, 299, 311, 475
- Logic 11, 22, 39, 44, 48, 55, 63–71, 73–75, 83, 99–100, 103, 105, 107, 111–112, 115–120, 131, 138, 162, 177–178, 180–181, 187, 189–198, 201–207, 210–211, 213, 218, 221, 229–231, 236, 239–242, 244, 259–261, 264–265, 267–268, 271–273, 275, 276–278, 281, 291, 295, 300, 305–306, 309–310, 320, 325, 327–328, 332–333, 335–336, 338, 347–351–354, 357, 368–369, 373, 376–377, 379, 381–383, 388, 394, 397, 407, 409, 413, 415, 418, 421, 423, 425, 430, 432, 438, 451, 459, 462–463, 466–467, 471–472, 475, 478–481, 483–485, 490, 495, 497–499, 507, 511, 515, 519, 525, 533, 535, 538, 541, 549–550, 570, 574
- Mathematical logic ix, 202, 204–205, 350, 435, 483
- Minute logic 263, 271, 276, 291, 297, 466–467, 472
- Love 169, 191, 211, 234, 280, 441, 514
- Evolutionary love 2, 105, 147–148, 151, 161–164, 432, 470–471
- Mathematics vi, ix, 2, 64, 74, 85, 119–120, 128, 148, 169, 172–173, 202, 209, 213, 218, 221, 247, 265, 272, 292, 295–296, 299, 349–350, 387–388, 451, 468–469, 472, 483–484, 494, 496–497, 501, 512, 556
- Metaphor 128–129, 284, 320, 339, 341–346, 360–362, 484–485, 494, 503–506, 571
- Metaphysics 39–41, 43–44, 138, 147, 149, 171, 173, 207–211, 221–227, 240, 272, 276, 279, 299, 316, 327, 396, 400–401, 430, 432, 434–435, 451–453, 455, 459, 465, 476–477, 481, 503, 518, 524
- Musement 3, 163, 368, 513–517, 519, 521–523, 526
- Natural language 88, 115–117, 120, 447–448
- Naturalism 1, 4, 77–79, 225
- A Neglected Argument for the Reality of God 1, 77, 162, 512, 521, 523–524, 537, 555
- Nominalism 16, 33–34, 39–44, 251, 279–281, 315, 317, 321–322, 333–334, 396, 401, 458, 477, 540, 554
- Non-ego 328, 374, 376, 547, 562, 565–566
- Normative science 55, 60, 173, 179, 187, 218, 259–260, 271–272, 281, 299–300, 306, 326–327, 334, 347–348, 350, 379, 381–382, 413, 421–426, 503, 515, 541, 574
- Objective idealism 149, 208, 323, 432, 459
- On a New List of Categories 13, 23, 265, 267, 269, 341, 380, 430, 527, 561
- Ontology 84, 207–208, 222, 239, 241–242, 296, 477
- Perception 17, 37, 57, 91, 155–156, 158, 162, 164, 187, 189, 191, 193–195, 274, 277, 284, 288, 301, 326, 333, 345, 365, 367–369, 374–377, 379, 382–383, 401–402, 413, 416, 496, 505, 516–517, 542, 547, 557, 563, 566
- Phaneron 196, 299–301, 417–418, 515, 561–564
- Phaneroscopy 299, 375, 417, 494, 561
- Phenomenology 74, 107, 176, 182, 209, 218, 264, 272, 331, 373, 375, 378, 380–383, 417, 429, 561
- Philosophy 6, 23, 41, 43, 50–51, 84–86, 94, 105, 115, 117, 120, 138–140, 142, 158–159, 161, 166, 169, 171–174, 178, 202, 209–210, 213–214, 217–218, 230, 233, 235, 240, 245, 251, 266, 269, 271, 273–276, 280, 315–316, 319, 323, 325–326, 332, 333–334, 347, 350, 357, 365, 369–370, 373, 379, 381, 385–389, 397, 400, 414, 422, 424–425, 430–431, 433–435, 451–455, 465, 467–468, 472–473, 477, 480, 484, 501, 517–519, 525, 553–554

- Evolutionary philosophy 145, 148, 453, 516
- History of philosophy 21, 271, 383
- Philosophy of mind 161, 326, 378
- Philosophy of religion 1, 40, 214, 318
- Philosophy of science 42, 276, 296, 357, 369
- Scientific philosophy 109, 517
- Theoretical philosophy 41, 43, 218
- Physical laws 4, 87–89, 91–94, 123, 454
- Plato 11, 21, 33, 39, 154, 213, 215, 523, 525
- Pragmatism xiii, 6, 44, 104, 113, 120, 173, 209, 212, 273, 313, 315, 317, 319, 331, 383, 394, 399–401, 411, 429–435, 443, 452–453, 458, 466–468, 473, 476–477, 480–481, 483, 488–489, 503, 518–519, 524, 537–539, 541, 543, 546–547, 569–570
- Pragmatism 14, 37, 40, 42, 44, 53–55, 86, 112, 140, 142, 146, 170, 173–174, 187, 209, 213, 229, 233, 239–240, 242, 271–273, 275, 306, 313, 315, 317, 321, 325, 331, 368, 373, 379–383, 385, 399–400, 321, 423, 425, 429–431, 435, 443, 451–452, 465–470, 472–473, 475–481, 487–488, 491, 493, 518, 524, 538–541, 553, 555, 569
- Lectures on Pragmatism 15, 187, 217, 373, 380, 385, 443, 472, 527
- Pragmatist 16, 18, 36, 40–43, 53–55, 59, 112, 140, 169–170, 213, 283, 315, 317, 319, 321, 356, 366, 380, 382–383, 400, 423–427, 429, 431, 434–435, 467, 475–477, 480, 525, 537–538, 541, 543
- What Pragmatism is 239, 273, 315, 399, 429, 443
- Proposition 28–30, 38, 57, 60, 74, 103, 108–109, 113, 118–119, 128, 131–136, 148, 171, 201–206, 239, 241–243, 260, 264–265, 267–268, 276, 296, 318–321, 335–338, 348–349, 354, 356, 373, 381, 388, 406–408, 424, 451, 453, 460, 474, 499, 509–510, 524, 541, 563
- Qualisign 99, 101, 266, 340–341, 508–510
- Ransdell, Joseph 14, 17, 94, 129–130, 137, 293–294, 440, 462
- Real Object 133, 222, 269, 439, 451, 495, 540, 546
- Reality 2–4, 13, 15–19, 22–23, 28, 33–34, 38–42, 45, 51, 57–61, 63, 65–66, 68, 70, 73–77, 89, 97, 105, 109–110, 115–116, 131, 165, 167, 196–199, 208–209, 222, 226, 239–240, 243, 246, 256–258, 279, 298, 310, 326–327, 337, 381–382, 396, 400–401, 403, 451–452, 454, 477, 479–480, 493, 501, 539–540, 546–547, 554–556, 562, 570
- Reasoning 23–24, 37, 54, 57–58, 63, 67–68, 70, 73–76, 79, 91, 105, 109–112, 115–120, 128, 133–134, 139, 149, 162, 172, 174, 178–182, 185, 187, 189–191, 196, 202, 211, 229, 231–232, 240–243, 246, 265, 273, 284, 295–296, 300, 311, 347–351, 354, 356, 365–371, 373, 382–383, 389, 408, 411–413, 425, 427, 456, 467, 471–472, 483–484, 486, 496, 505, 515, 522, 541, 549, 555–556, 569, 571–574
- Diagrammatic Reasoning 295–296, 483–486, 528
- Reasoning and the Logic of Things 207, 213, 230, 320, 388, 391
- Recognition 21, 70, 73, 83, 100, 128, 145, 163, 182, 223, 271, 311, 327, 329, 368, 370, 445–446, 452, 462, 507, 539, 541, 556, 558, 572
- Representamen 96–101, 103–104, 120, 130, 266, 339–341, 359–361, 416, 445, 484, 494, 504, 505, 557
- Royce, Josiah vi, x, xv, 164, 168, 234, 327, 434–435, 476, 481
- Russell, Bertrand 95, 204–205, 224, 401
- Satisfaction 16, 54, 245, 248, 379, 525–526, 537–539, 542–543
- Scholastic realism xii, 39–44, 63, 89, 399, 477, 540
- Secondness 34, 81–82, 93, 95, 98–99, 106, 183–184, 193–194, 196, 208, 234, 237–238, 247, 255, 257, 299, 327–328, 333, 344, 347, 375–377, 381–382, 406–408, 418, 430–431, 433, 434, 519, 522–523, 538, 547, 562–563, 565

- Self 6–11, 14, 17, 21–24, 66, 110, 158, 163–167, 182, 198, 210–211, 299–303, 394, 396–397, 403, 443–447, 490, 515, 521, 548, 554–555
- Semeiotic xiii, xiv, 13, 67, 116, 120, 301–303, 316, 429, 504, 551, 557, 559, 569, 571–573
- Semiotics v–vii, ix–x, xii–xiii, 6–7, 45–48, 51, 87–89, 82, 94, 125, 140, 202, 207–210, 230, 240, 242, 256, 258, 260–261, 267–268, 284, 289, 291, 295, 345, 351, 393–395, 397, 405, 409, 415–416, 432–435, 446, 457, 459, 466, 468, 473, 480, 484–485, 493–495, 501, 507, 512, 519
- Semiosis 7, 10, 13, 17, 19, 35, 40, 84–86, 88, 93, 95, 97, 99, 103–104, 125, 149, 155, 161–164, 167, 174, 208, 259, 261–262, 269, 288–284, 287–289, 291, 311, 342, 385, 408–409, 430–431, 434, 445, 457–461, 463–464, 488–489, 493, 501, 511, 522, 554–555
- Sensation 24–27, 57, 82, 170, 193, 195, 198, 281, 326–327, 329, 366, 368, 375, 382, 453, 496, 525, 561, 564, 571, 573
- Sentiment 5, 53, 70–73, 75, 140, 168, 174, 188, 191, 204, 211, 221, 225, 246–247, 251, 273, 321, 422, 424, 471, 517, 547–548
- Signification v, 85, 116, 133, 197–198, 272, 284, 288, 333, 445, 484, 557–560
- Sinsign 99–100, 266, 340–341, 343, 485–486, 508–510, 530
- Social impulse 57, 59, 70, 73, 112, 188, 191
- Speculative grammar 267–268, 340, 344–345, 351, 483–484, 507
- Subject 8, 10, 23, 25–26, 155, 166, 168, 256, 260, 386, 394–396, 444, 446, 562, 565
- Intersubjectivity 22–23, 25, 447
- Subjectivity 261, 394–398, 347
- Summum bonum 71, 79, 138, 272, 277, 281, 320, 334, 519
- Symbol 36, 82, 96, 99, 105, 115–116, 132, 134–135, 155–159, 163, 165, 167, 201, 203, 210, 254–255, 257–258, 261, 267–268, 276, 285, 340, 342, 351, 359–360, 382, 495, 504, 513, 527, 540–541, 549, 551, 558, 571, 573
- Synechism 6, 9, 13–15, 17, 44, 64, 88, 90, 107, 123, 125, 159, 208–210, 394, 396–397, 401–403, 430–432, 459, 477, 517, 570
- Teleology 14, 123, 145–146, 149–151, 180, 243, 519
- Testimony 14–15, 19, 21–26, 300, 400, 409, 425, 438, 549–551
- Theism 4, 42, 145–146, 225, 316, 318, 320, 323, 465, 478
- Thirdness 14–15, 24, 33, 82, 89, 93–95, 98, 106, 117, 173, 183–184, 193, 197, 208–209, 238, 277, 279, 281, 299, 327, 333, 375–378, 381–383, 406–409, 418, 430–431, 433–434, 460–461, 463, 510, 519, 522–523, 538, 562–563
- Thought-sign 35, 109–110, 264, 302, 408, 446
- Token 96–97, 209, 244, 265–266, 295–296
- Triadic relation 89, 93, 285, 287, 339, 341, 360, 416, 486, 509, 511, 545–547, 562
- Trichotomy 254, 259–260, 266, 268, 340–342, 345–346, 507, 511
- Truth 9, 13, 15, 28–29, 42–43, 48–51, 53–55, 58, 60, 65–66, 71, 73–75, 79, 105–106, 111–112, 116, 128–129, 133–135, 148, 171–172, 187–188, 201–202, 204–206, 214–219, 222–226, 229–234, 241, 249, 256, 264–265, 275–278, 292, 300, 305–306, 311, 318, 320, 325–326, 335–338, 348–351, 401, 415, 428, 430, 432, 435, 438, 441, 453, 477–479, 501, 515–516, 524, 526, 537–545, 550, 554, 562, 572, 574
- Tychism 6, 107, 123, 125, 208, 570
- Universe of Discourse 118, 120, 202–205, 241–242, 550–551
- Vividness 328, 374, 401, 564–566
- Whitehead, Nobert 205, 211, 224–225
- Wittgenstein, Ludwig 25–26, 38, 283, 381, 393, 554