C. S. Peirce and the Deconstruction of Tradition

C. S. Peirce and the Deconstruction of Tradition:

Reality as a Sign

By

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TABLE OF CONTENTS

Acknowledgements vi

Foreword ix
Silvia Waisse, Professor at the Catholic University of São Paulo

Introduction 1

Chapter 1 8
Peirce and the Philosophical Tradition

Chapter 2 51
Signs in the Prehistory of Semiotics

Chapter 3 95
Elements of Ontology in the Semiotics of Peirce

Chapter 4 147
Epistemological Implications in the Semiotics of Peirce

Chapter 5 209
The Meaning of C. S. Peirce's Pragmatic Method

Addendum 236

Bibliography 258

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All this time, my family has been by my side. I owe my children many hours of attention which I spent in front of the computer, sometimes very late at night. I hope I may be able to catch up (perhaps with my grandchildren), after they read the book in which I became so absorbed that I failed to give them the time they deserved. I thank my late wife Speranta, who was always beside me and, with her discretion and grace, made it possible for me to adventure into issues which are so difficult to understand yet which she accepted as one of my frolics. She was the base that kept everything together.

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I also thank my friend and spiritual brother, Patrick Marius Koga, an associate professor in many prestigious institutions, such as Tulane, Berkeley, Oxford, the World Psychiatric Association (WPA), and another whole page of references. He and I had the first discussions about ontology and epistemology that brought me clarity and precision of thought thanks to his lively, critical, and watchful spirit. Indirectly, this book is a continuation of the days and nights when together we looked for the basic grounds of everything which is real.

Last, but not least, I want to extend my gratitude to my patients. Without them, I would have never found an interest in semiotics; without them, I would not have tried to approach signs. They were the ones who confronted me with the issue of *the reality of signs*, as signs are the only things which patients convey to me. Every day, a physician must interpret signs. Their meaning is not abstract, as it entails vital decisions and immediate action. The toughest possible confrontation which practical medicine and semiotics share is with the reality of signs. In medicine, ultimately the decision that follows the correct interpretation of signs means health and life.

FOREWORD

"There is a kink in my damned brain that prevents me from thinking as other people think" (C. S. Peirce)

One could quite safely say that Charles Sanders Peirce (1839–1914) was probably the last representative of the small elite comprising the great polymaths whom the history of occidental thought left behind as a priceless legacy. An attempt to résumé his many accomplishments and areas of interest in a few words is an impossible task.

Instructed in logic and mathematics, he generated extensive research throughout the entire domain of knowledge from astronomy to psychology, and his contributions to epistemology and the development of scientific methodologies are as significant as those in any other area. Let's add to this already complex overview that he was an amazingly prolific writer: He wrote around a hundred thousand pages, of which only 12,000 were published during his lifetime. The editing of the writings of Peirce, which began in the 1930s, is a truly Herculean work and one that is not, by a far cry, close to the end. Therefore, it is somewhat curious and difficult to understand that until recently, Peirce has been known primarily as the founder of pragmatism, which is a theory of action.

If physicists are still looking for an endlessly elusive "unified field" that would be able to ground a definitive theory "about the whole," Peirce set out to resolve – and succeeded in resolving – an incommensurably more ambitious puzzle: What is reality and how do we experience it?

As is generally known, the short answer that Peirce gave to this question may be summarized in a word: the *sign*. Reality presents itself to us as signs that acquire meanings only when someone or

something interprets them; a sign is "something that stands for something to someone in some capacity."

Is this merely another philosophical, purely theoretical question – merely another topic of endless debates within honorable academic institutions and scholarly publications? If that were true, it would be rather futile to pursue it, because after Kant, there is probably little left to say: Peirce would be solely the "father of pragmatism." Yet the situation is far more interesting and complex, and it has lots to say to us all.

Few people know, for instance, that biology, the science of life, actually suffered a radical change in paradigm, which entailed a dramatic change in the way we see the world and ourselves in it. That change commenced in 1943, when the physicist Erwin Schrödinger posed the question: what is life? And he responded: it is a code – that is, a system of signs which mean something to someone. That was the cornerstone in the matter of elucidating DNA and the human genome structure. It paved the way for all areas of modern biology – known as "omics" – that consider every aspect of living nature (genomics, proteomics, transcriptomics, foodomics, etc.). It is what we nowadays generally call bioinformatics, given that the primary feature of living beings is their ability to process information, while information is transmitted/constructed through signs.

These data briefly point to the crucial significance of the theory of signs – that is, semiotics – and implicitly to the works of Peirce. As he understood that our entire perception of reality is never immediate but rather is inherently mediated through signs, Peirce was the first since Aristotle to succeed in developing not only a new ontology but also his own epistemology and logic that led to science.

In face of the huge implications of Peirce's thought for current science and human experience as a whole, we have no choice but to commend the bravery of this work, as well as that of the author, who goes deep and navigates through this domain with impeccable

control of the subject matter. Perhaps it takes another polymath to approach such a difficult topic.

If Peirce has been deemed a modern Leonardo da Vinci, I think the same could be said about Gheorghe, known as Dr. Jurj to his patients and as Relu to his friends. An excellent practitioner of general medicine and an attending with multiple areas of expertise, such as acupuncture and homeopathy, a homeopathy professor who teaches exclusive courses all over the world, from Russia to Latin America, a Doctor of Philosophy, and a commentator on Patanjali, Jurj knows how to set matters into a "theory of the whole." Aside from his being a musician, a writer, a poet, a painter, and a professional swimmer, he's one of the few original thinkers on present-day medical semiotics, with the entire arsenal of connotations which Peirce's theory entails.

Most of the current academic writings on Peirce's thought range from internalist attempts to understand its intrinsic development to pure exegesis. While the injunction to read any text in its own context often leads to dogma, there are in fact very few people who have tried to set Peirce's work in its double context – vertical and horizontal – of the theory of signs, society, and culture at the end of the nineteenth century. This is where the originality of Jurj's work stems from.

While he writes in a simple manner, which is accessible to everyone who might find an interest in the matter, Jurj first clarifies Peirce's place within the millenary tradition of philosophy and semiotics, from Aristotle to the present day, according to the newest approaches to historical epistemology, which attempt to identify the elements of both continuity and discontinuity within the history of ideas. This entails the particular idea of de(con)struction. Again, in a manner that differs from standard academic approaches, in his analysis of Peirce's dialogue with the philosophical and semiotic tradition, Jurj always keeps in sight that the North American polymath was an end-of-the-nineteenth-century thinker. Therefore,

the author ably avoids the trap of anachronism, so common in many of the previous studies, a trap which distorts most attempts to achieve accurate perspectives.

In the last two chapters of the book, Jurj guides the readers step by step, in a natural and unstudied manner, into the intricate aspects of Peirce's ontology, epistemology, and logic by use of new, Peircean concepts. Perhaps the inherent difficulty of the initial texts caused previous researchers to exclude ontology from the grounds of Peirce's whole system and to prefer an easier approach, strictly connected to signs. Devoted to the subject master and sagacious, Jurj chooses the opposite way and manages to integrate so-called pragmatism into the global image of Peirce's thought, wherein reality, knowledge, and action are essentially connected.

As an extra bonus for the reader, the book ends with an analysis of the double connection between the theory of signs and medical semiotics. As has been generally known from classic antiquity to the present day, medicine is a discipline of signs by its very nature. In its turn, as it evolved as formal philosophy and as a field of scientific research, the theory of signs had a profound impact upon medical signs. In this instance, Jurj presents his original perspective on medical signs for the first time in a comprehensive yet fugacious manner and engages in dialogue with semiotic thought. For the above reasons, this book is a *must-read* for physicians as they work with signs in their everyday praxis.

On the other hand, it is a reference academic work for those who are interested in semiotics: It was the most pertinent, solid, and thorough analysis of Peirce's – and, possibly, all modern – semiotics written in Romanian; now, in English translation, it can hope to find appreciation among a much broader readership.

As for the general public who find an interest in the way in which we live reality, including what science might bring in the future, the broad scope and the clear (yet not facile – sometimes just the opposite) style of the book may easily introduce and assist the reader

within the essential puzzle of existence. The thesis which Jurj proposes after an exacting examination of Peirce is that of *reality as a sign*. This means that at all times, what is being presented to us as knowledge is a sign which we interpret according to our own possibilities.

At the end, I would like to mention a Talmudic story which tells us about two possible ways that we can choose in life. The story goes that, as he was traveling, a wise man ran into a child at a crossroad. The wise man asked the child: "Which is the way to the city?" The child responded: "Look, this is the short yet long way. The other is the long yet short way."

Like most of us, the sluggard wise man took the short way, but before he could reach the city he ran into a thick forest that was impossible to get through. He went back to the child and said: "Son, you told me that was the short way. But I can't go through!" The child replied: "Did I not tell you that was also the longest way?"

Avoiding the swindles of the intellect and the seductions of facility, Jurj chose the long way, the difficult way, which requires effort and time. Yet, eventually, it was the shortest, because it led right to the desired destination: this book.

Silvia Waisse, Professor at the Catholic University of São Paulo
June 24, 2016

INTRODUCTION

Charles Sanders Peirce (1839–1914) was the primary contributor to the development of American philosophy. He introduced and drew the fundamental lines of the theories both of pragmatism and of semiotics. During his lifetime, he was viewed first as a scientist, then as a logician, and only after his death as a philosopher. He was the established founder of semiotics. The fertility of his ideas is proven by the fact that, as time passes, the discussions and developments that stem from his ideas do not fade away. On the contrary, they proliferate.

This study's objective is not so much to discuss the so-called "pragmatism" of Peirce, but to discuss his attempt to elaborate a comprehensible system – a system that could approach the entire domain of knowledge. Pragmatism, as a philosophical orientation, represents, in Peirce's own eyes, merely a by-"product" that his theoretical efforts to ground scientific knowledge entails. Beginning with his youth writings, his major preoccupation was epistemological: What do we know? How do we come to know it? How do we attest to that knowledge? How does knowledge progress?[1] Therefore, it should not come as a surprise that, even in his first theoretical writings, Peirce critiques both Cartesian dualism and Kantian apriorism.[2] In contrast to them, Peirce offers a model of knowledge

[1] C. S. Peirce, "Intrebari privind anumite facultati pe care se presupune ca le are omul," in *Charles S. Peirce: Semnificaţie şi Actiune*, trans. Delia Marga (Bucureşti: Humanitas, 1990), 43–66; see also L. Santaella, *O Metodo Anticartesiano de C. S. Peirce* (São Paulo: Ed. UNESP, 2004).

[2] See C. S. Peirce, "On a New List of Categories" (1867), in *Collected Papers of C. S. Peirce*, ed. Charles Hartshorne, Paul Weiss, and Arthur W. Burks (Cambridge, MA: Harvard University Press, 1931–1935, 1958), Vol. 1, 229;

which necessarily includes three factors that are indissolubly connected within a triadic interconnectedness that transcends the basic dualism of "subject versus object."

For a subject to be able to know an object, a relationship has to be established between them; the relation itself represents a mediating reality that makes the act of knowing possible. To Peirce, this mediating reality has the nature of the sign. Thus, the sign becomes not only the interface between an object and a subject but also the entire space of knowledgeability. This is why Peirce was constantly preoccupied with defining, deciphering, and understanding the role of the sign in the process of knowing, which led, as a logical consequence, to the necessity of a discipline of signs and, thus, to the foundation of semiotics.

As far as semiotics is concerned, the question emerged as to whether semiotics was a science or a method,[3] as there were arguments for either response. What I will try and demonstrate in the present study is that, for Peirce, semiotics is more than a method: It is a comprehensive epistemological approach, which entails, at the same time, both ontological and praxiological perspectives. Peircean pragmatism is an extension of his epistemology: By what particular means does the process of knowing, which is a process of ongoing semiosis, come to validate one or other of the concepts we work with?

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from here on, we will cite this work conventionally, i.e., CP followed by volume number and paragraph – so, in this case, CP 1.229.

[3] M. L. Santaella Braga and K. M. B. Mundy, "Semiotics: Science or Method?" *Dispositio* 6, No. 17/18 (1981): 109–117. Aurel Codoban shows that "in formulating the epistemic self-awareness, semiology seems to oscillate between defining itself as a discipline among others or a hyper-theory; a theory or a method; a theory/method which every discipline may acquire or interdisciplinarity"; see *Semn și interpretare. O introducere postmeodernă în semiologie și hermeneutică* (Cluj: Dacia, 2001), 18.

On the other hand, his epistemology expands his ontology, as well as a new definition of categories, which is different from Aristotle's or Kant's. The Peircean categories are merely three. They are defined in the simplest terms as *Firstness*, *Secondness*, and *Thirdness*.

Unlike those of his pragmatist contemporaries (William James, John Dewey) who fell, more or less, into oblivion, Peirce's thoughts remain a teeming source of theoretical elaboration and debate. Thus, nowadays we find groups of studies and publications dedicated to him all over the world. Likewise, any discussion or semiotic approach within a particular discipline, such as biosemiotics, visual semiotics, mass media semiotics, etc., inevitably begins by reference to Peirce's works.

Why? Where does this fecundity of his ideas that makes him so contemporary to us come from?

To answer this question, I set out from the hypothesis that Peirce represents a crossroad in philosophical thought, which is not yet exhausted in terms of its implications. It offers a new perspective in approaching certain ongoing philosophical matters, such as the subject–object opposition, nominalism versus realism, or cognoscibility versus non-cognoscibility.

Albeit he kept dreaming of it, his philosophy has not actually formed into a consolidated system in published books (despite their being long planned). It remains spread throughout articles, letters, and personal notes. Thus, perhaps, commentators' temptation to retrace a system that was never finalized and taken as far as its ultimate consequences.

Another factor that might explain the actuality of Peirce's ideas is the development of communication studies and of the disciplines concerned with signs, starting in the second half of the twentieth century. The presence of signs with various meanings (intentional or not) in our everyday lives becomes more and more important: As we walk down the street, signs guide us along, we communicate

through verbal and nonverbal signs, signs emerge on the computer screen and point to certain procedures, etc. In a world so replete with signs, the attempt to understand their grounds is legitimate. Peirce was among the first to approach an understanding of their nature.

Perhaps his most important theoretical contribution was the foundation of semiotics. What run through Peirce's entire perspective from one end to the other is the fact that human knowledge and action are based on signs. In each of his criticisms regarding the views of other philosophers, he sets out from the idea that signs are all that we people may talk about; they are dynamic elements that connect an object to a representation in the eyes of an interpretant. Thus there is no other reality but the reality of signs.

Even in his earliest philosophical writings, Peirce parts with Cartesian ideas regarding knowledge and the relationship between the knower and the known, and therefore we can call his view truly anti-Cartesian.[4] The construction of a new method for the sciences, Peirce's initial project, implied confrontation with Rene Descartes' and Immanuel Kant's methods. It is notable that Peirce not only critiqued them but also moved forward to elaborating an ampler perspective on the mind, human knowledge, methods of science, and reality.[5] The original concept that Peirce opposes to Cartesianism is essentially the concept of thought as a sign, conceived as mediation in a triadic relationship: A sign is connected *to* something (a thought which interprets it), it stands *for* a certain object, and it is a sign *in some respect* or quality that places it into a relation with its object.

A sign-thought represents "its object in the respect which is thought," [6] and in that respect, it is the unmediated object of consciousness itself and it may become a sign for the subsequent thought. The sign does not identify with the signified object, and it

[4] A broader discussion on this matter can be found in Santaella, *O Metodo Anticartesiano de C. S. Peirce*.
[5] Ibid., 22.
[6] CP 5.286.

has certain particularities:[7]: (1) the *material qualities* of the sign are those that properly belong to it, without any connection to the representational function; (2) the *purely demonstrative application* of the sign represents the real physical connection of the sign with its object, either directly or through another sign; (3) the *representational function* of the sign is that which the sign represents for a thought, for a person.

For all the above reasons, this study sets out to examine Peirce's thought as a philosophy with an ontology and epistemology defined around his semiotics and not as an autonomous semiotics. Therefore, I set out a critical reassessment of Peirce's ontology and epistemology as related to semiotics (Chapters 3 and 4).

For the initial part of this study, I intend to use the method of reading and confronting the primary and secondary sources on Peirce's work, while keeping an eye on the evolution and development of his ideas in ontology and epistemology. The main questions which I choose as the guides throughout the readings are:

- What reality does Peirce refer to?
- What are the Peircean categories?
- How do we come to know what we know?
- What relationships are established among the factors of knowledge?
- How does knowledge get validated?
- How do we move from knowledge to action?

By use of these guiding questions, I systematize the huge bibliography that exists around Peirce's epistemological and ontological ideas. I placed his ideas within the larger context of their problematic in relation to the philosophical tradition (Chapter 1) and the semiotic ideas of certain previous thinkers, especially from antiquity and the Middle Ages (Chapter 2).

[7] CP 5.287; 5.290.

As for the methodology of the study, I used two types of approach that, to a certain degree, distinguish this work from others within the vast literature on Peirce. First, I have opted for a chronological approach that is centered on the questions that Peirce answered, sometimes differently, throughout his life. The primary reference work for Peirce, *The Collected Papers of Charles Sanders Peirce*,[8] is organized thematically based on criteria of the editors' choosing as to how his extensive written material could be classified. I have preferred to use *Writings of C. S. Peirce: A Chronological Edition* more, so that I can observe the author's ideas in their dynamic development. A possible point of originality of this book is, hopefully, that I have tried to find Peirce's underground, living flow of thought, instead of taking for granted its character, already compartmentalized into topics and areas.

Secondly, it is because of the approach just mentioned that I felt compelled to go over and take into account many of the manuscripts that were not published during his lifetime, sometimes mere sketches, at other times projects that were never finalized in the form

[8] Major editions of Peirce's works are: *The Collected Papers of Charles Sanders Peirce*; *The Essential Peirce: Selected Philosophical Writings*, ed. Nathan Houser and Christian J. W. Kloesel (Bloomington, IN: Indiana University Press, 1992), referenced hereafter as EP followed by volume and page number, e.g., EP 1: 34; *Arithmetic: New Elements of Mathematics*, ed. Carolyn Eisele (Atlantic Highlands, NJ: Humanities Press, 1976); *Charles Sanders Peirce: Contributions to the Nation*, ed. Kenneth L. Ketner and James E. Cook (Lubbock, TX: Texas Tech University Press, 1975–1987); and *Semiotic and Significs: The Correspondence Between Charles S. Peirce and Victoria Lady Welby*, ed. Charles S. Hardwick (Bloomington, IN: Indiana University Press, 1977). A comprehensive collection of around thirty volumes, of which the first six have been edited, *Writings of Charles S. Peirce: A Chronological Edition*, ed. Max. H. Fisch, Edward. C. Moore, Christian J. W. Kloesel, and Nathan Houser (Bloomington, IN: Indiana University Press, 1976–2000) is in the process of being edited under Nathan Houser's supervision within the Peirce Edition Project; this is cited as WP followed by volume and page number, e.g., WP 28: 10.

of a book, or drafts of subsequent articles. While not being oblivious to the published works, I have often preferred to focus on these manuscript fragments (cited as MS), wherein Peirce's thought is more spontaneous, more lively, and, sometimes, even more synthetic. As I went through them, I could sometimes see those initial moments, often muddled, when certain ideas emerge, albeit in forms that were still incompletely defined. On the other hand, I could also track their step-by-step development and their refinement into the complex forms of the published articles. This type of reading allowed for an incursion into the intimacy of Peirce's thoughts, a more dynamic view of them, and it sometimes led to unexpected conclusions.

Peirce saw semiotics as one of the possible instruments for the scientific method. Therefore, as an addendum, I have attempted an evaluation of the possibilities of semiotics within a particular field, namely medicine. For this last part of the book, I set out to emphasize the relevance of the semiotic approach in medicine as a case study, while tracking the constitution of medical signs and the way in which their semiotic analysis may lead to certain knowledge and actions, by asking questions such as: what is a medical sign? What are the object, the representamen, and the interpretant of the medical sign? How does the signifying process occur in medicine?

CHAPTER 1

PEIRCE AND THE PHILOSOPHICAL TRADITION

A hundred years after the United States' Declaration of Independence, Charles Sanders Peirce (1839–1914) offered the first major American contribution to the development of philosophy through his conception whereby he drew the fundamental lines of the theory of pragmatism.[9]

Are certain categorical statements – such as John Deely's "Peirce also destroyed the common foundation upon which the mainstream modern philosophers, from Descartes and Locke to Kant, analytic philosophy and phenomenology in our own day, had constantly built"[10] and "Postmodern times began in philosophy with Peirce's doctrine of categories,"[11] or that of Karl Popper, who sees Peirce as "one of the greatest philosophers of all times"[12] – merely the biased opinions of his enthusiastic admirers, or do they reflect the fact that Peirce does indeed represent a crossroad in the development of philosophy?

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[9] This is a widespread characterization; see, for instance, N. Houser, "Introduction," in *The Essential Peirce*.

[10] J. Deely, *The Beginning of Postmodern Times or: Charles Sanders Peirce and the Recovery of Signum* (Helsinki: The Metaphysical Club of the University of Helsinki, 2000), 4.

[11] Ibid.

[12] James Bird, "A Giant's Voice from the Past," *Times Higher Education Supplement*, Sept. 8, 1989.

During his lifetime, he was viewed first as a scientist, then as a logician, and only after his death as a philosopher.[13] He is the recognized founder of semiotics, while the productivity of his ideas is proven by the fact that, as time passes, the discussions and developments that proceed from those ideas do not dwindle; rather, they proliferate. Currently there are several institutions, study groups, and publications globally, in various languages, that focus on the study of pragmaticism and the Peircean conception.[14]

He wrote a lot, yet he published relatively little – articles, rather than books – on widely divergent topics that cover a huge domain: from mathematics, chemistry, and physics to psychology, anthropology, and economics, from the history and methodology of science to the theory of signs. Peirce's published work is somewhat fragmentary. It includes articles that he wrote for various journals, letters, and notes. It amounts to a total of approximately 12,000 pages; another 80,000 pages of manuscripts were never published during his lifetime. The complete edition of his works, a project that began in 1982 and has reached the eighth volume, was estimated by Max Fisch, the author of the foreword to the first volume, to include a total of twelve volumes. It has also been estimated that a complete edition of all the writings of Peirce would require more than 100 volumes, 500 pages each, and that a minimum of fifty volumes

[13] M. Fisch, "Introduction," WP 1.

[14] Since 1965, the society named after the philosopher edits the journal *Transactions of the Charles S. Peirce Society*. Among the rich, high-quality electronic sources, it is worth mentioning The Peirce Edition Project, under the coordination of Nathan Houser, which has functioned since 1976 and is preoccupied with the editing of all the Peircean manuscripts (www. peirce.org); *The Peirce Gateway*, edited by the Peirce Group (www.cs peirce.com); *The Digital Encyclopedia of Charles S. Peirce*, edited by Joao Queiroz and Ricardo Gudwin (www.digitalpeirce.fee.unicamp.hr); the electronic journal *Cognitio – Estudos*, published in Portuguese since 2004, edited by the "Center of Studies on Pragmaticism" from São Paulo; and "El Grupo de Estudios Peirceanos" of the University of Navarra, created in 1994 (www.unav.es/gep).

would be necessary for a more thorough idea of his contributions to mathematics, logic, natural sciences, psychology, philosophy, and other fields.[15]

Of course, starting with Plato and Aristotle, the development of philosophy itself reflects, sometimes across centuries, a permanent dialogue between thinkers. One way or another, each thinker connects to others before them or contemporary with them, whom they agree with or do not, from whom they adopt certain ideas and then develop or combat those ideas. Unlike scientists, who build on the entire development of the discipline prior to them and contemporary with them, philosophers, albeit they engage in dialogues with one another, even across centuries, start everything all over again, while apparently asking the same questions. This is not because they would be ignorant toward each other; on the contrary, they would relate to one another and most of the time argue for or specify their different positions. Thus, on the one hand, there is continuity within the grand flow of philosophical thought; on the other hand, each thinker is a moment of discontinuity and a distinct voice. In the case of Peirce, as in Plato's, Aristotle's, Spinoza's, or Kant's case, we see the type of attitude that is fundamentally philosophical: They start all over again.

In this first part of this work, the question which I attempt to respond to is this: How does Peirce inscribe his thought into the development of philosophy? I examine his relationships with the philosophical tradition and the way in which, perhaps, his original conceptions join some of the major themes in philosophy. To understand the characteristics of Peirce's conception, I think that a brief incursion into his biography and his intellectual growth is necessary.

[15] N. Houser, "Foreword," EP 1: xvii.

On Peirce's Intellectual Growth

According to Fisch, Peirce was the most original and protean intellect that America ever produced.[16] The complexity of his preoccupations, of the domains in which he exerted them and to which he made his personal contributions, is impressive: He was a mathematician, an astronomer, a chemist, a geodesist, a coast supervisor, a cartographer, a meteorologist, a spectroscopist, an engineer, an inventor, a philologist, a lexicographer, a historian of science, an economist, a student of medicine, a book reviewer, a dramatic author, an actor, a short novelist, a phenomenologist, a semiotician, a logician, a rhetorician, and a metaphysician.[17]

Peirce was born on September 10, 1839, in Cambridge, Massachusetts.[18] His family included academics and intellectuals from Harvard University, so Charles Sanders Peirce grew up in that milieu.

His father, Benjamin Peirce, was a professor of astronomy and mathematics at Harvard University for almost forty years, a member of a small group known as "the Lazzaroni group," which made a decisive contribution to the institutionalization of science in the United States around the beginning of the nineteenth century and

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[16] T. A. Sebeok, *The Play of Musement* (Bloomington, IN: Indiana University Press, 1981); also in J. Brent, *Charles Sanders Peirce: A Life* (Bloomington, IN: Indiana University Press, 1998), 2ff.

[17] Fisch, "Introduction," WP 3:ii. In "The Essence of Peirce's System," *The Journal of Philosophy* 37, No. 10 (May 1940): 253–264, P. Weiss characterizes him: "Peirce was a metaphysician as well as a logician, a realist as well as a semiotician, a speculative thinker as well as an experimental scientist, an idealist as well as a naturalist, and a pragmatist who had a theory of ethics which acknowledged a fixed and universal ideal."

[18] For a more comprehensive view on Peirce's life, see Brent, *Charles Sanders Peirce*; K. Laine Ketner, *His Glassy Essence: An Autobiography of Charles Sanders* Peirce (Nashville, TN: Vanderbilt University Press, 1998); and M. Fisch, *Peirce: Semiotic and Pragmatism* (Bloomington, IN: Indiana University Press, 1986). A brief description of his intellectual biography may be found in the introduction to EP 1.

contributed to the creation of the American Association for the Advancement of Science, the National Academy of Science, the Smithsonian Institution, the Lawrence Scientific School, and the U.S. Coast and Geodetic Survey. He was recognized as the most respected mathematician in the U.S. in his time and as one of the brightest minds of North America. He has been credited with introducing mathematics as an object of study in North American universities. He made a contribution to analytical mechanics, to associative linear algebra, and to the applications of plane and spherical trigonometry to navigation. His studies had a role in the discovery and determining of the orbit of planet Neptune.

The role of the father in the intellectual formation of the son was decisive because, while posing interesting problems, he encouraged the child to think creatively and resolve problems in his own way. In this intellectually stimulating atmosphere, Charles Peirce got into the habit of thinking problems through in an original and independent manner.

Charles Sanders was a precocious child; at the age of twelve, already he had run into Richard Whately's book *Logic* – the standard textbook used at Harvard. He studied it in a few days, and that left an imprint on him forever, as it inured him to studying every problem as an issue of logic. At the age of sixteen, he began studying philosophy on his own. His first readings were Friedrich Schiller's *Letters in Aesthetics* and then Kant's *Critique of Pure Reason*, which he ended up deeming vitiated by insufficient logic three years later.

He graduated college at Harvard in 1859 and got his bachelor's degree in chemistry in 1863. From 1859, he enrolled in the U.S. Coast and Geodetic Survey, where he stayed until 1891. His duty was related to the computations through which gravitational force was determined in different places in the United States and other parts of the planet, to help determine the image of the earth.

All this while, beginning in 1860, he continued the study of logic, as he was preoccupied with various problems of this discipline. He

offered important contributions which would bring him recognition as the most important U.S. logician of his time. Peirce viewed himself as a logician at all times; in fact, during his lifetime, he was better known as a logician than as a philosopher. The notorious philosopher of science and logician Hilary Putnam comments in surprise that much of what is actually familiar in modern logic became known to the world of logic because of Peirce's and his students' efforts.[19] Willard Van Orman Quine admits that modern logic begins with the advent of the general theory of quantification, from Frege's and Peirce's hands.[20]

One of his logical systems was adopted by Ernst Schröder in his treatise *Vorlesungen uber die Algebra der Logik*. Schröder and Peirce knew each other's theories and carried on a correspondence.[21] Beginning with Schröder, who adopted certain ideas that belonged to Peirce, one can draw a direct line of development of modern logic to Giuseppe Peano,[22] Bertrand Russell,[23] and Alfred N. Whitehead.[24]

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[19] H. Putnam, "Peirce the Logician," *Historia Mathematica* 9 (1982): 290–301, quoted by Nathan Houser in "Introduction," EP.

[20] W. V. O. Quine, "In the Logical Vestibule," *Times Literary Supplement*, July 12, 1985, 767, cited in Houser, ibid. During the time he taught at Johns Hopkins University, Peirce developed a theory of the logic of the relatives and connectors independently of Frege, which he published with his student O. H. Mitchel in the collective volume *Studies in Logic: By Members of the Johns Hopkins University* (Amsterdam: John Benjamins Publishing Company, 1983).

[21] N. Houser, "The Schröder–Peirce Correspondence," *Modern Logic* 1 (1990/1991): 206–236.

[22] Albeit he accepted the usefulness of Peano's formalized system, Peirce was convinced that it was overrated: "Peano's system is no calculus; it is nothing but a pasigraphy [an artificial international language using mathematical symbols instead of words]; and while it is undoubtedly useful … few systems of any kind have been so wildly overrated," WP: MS 499.

[23] I. H. Anellis, "Schröder Material at the Russell Archives," *Modern Logic* 1 (1990/1991): 237–247.

[24] J. Nubiola, "Peirce and Whitehead," ed. Michel Weber (Frankfurt: Ontos, 2008), Vol. 2, 481–487.

In Whitehead's 1898 book, *A Treatise on Universal Algebra, with Applications*, Peirce is cited six times, and later, in a 1945 letter, Whitehead wrote that Peirce was a great personality, with many areas of interest wherein he produced original contributions. The essence of his conception was originality in every topic that he approached. Therefore, none of the conventional labels applies in his case. He conceived every issue in his own original way.[25]

It is remarkable that in 1867, the year when "On a New List of Categories" appeared, Peirce published four other important articles, all of them in the field of logic.[26] During the same year he was elected a member of the Academy of Arts and Sciences, and ten years later he became a member of the National Academy of Science. In 1869 he began working for the Harvard Observatory, which led to the publication, in 1878, of the only book he published during his life, *Photometric Researches*.[27]

The presence of Peirce in the scientific life of the moment was active, as he was invited to participate in many international meetings in the fields of geodesy, while his reports were acknowledged as important contributions to the measurement of gravity. Given his serious scientific formation and his interest in the methodology, the theory, and the history of science and work for many years in the area of

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[25] F. Young, "Charles Sanders Peirce: 1839-1914," ed Phillip P. Wiener and Frederick H. Young (Cambridge, MA: Harvard University Press, 1952), 271–276, 276.

[26] All articles were published in *Proceedings of the American Academy of Arts and Sciences* 7 (1867): "On an Improvement in Boole's Calculus of Logic": 250–261; "On the Natural Classification of Arguments": 261–287; "Upon Logical Comprehension and Extension": 416–432. Interestingly, "On a New List of Categories" was published as a continuation of the first two articles on pages 287–298.

[27] In a letter addressed to his mother in April 1872, Peirce wrote: "On clear nights I observe with the photometer; on cloudy nights I write my book on logic which the world has been so long & so anxiously expecting." Fisch, "Introduction," WP 3.

science,[28] Peirce's philosophical perspective is one in which science and the scientific community play an essential role in fixating beliefs and approaching the truth.[29]

As opposed to the huge breadth of intellectual areas he covered, wherein he was deemed an innovator, one cannot say that Peirce's social life was a success. In his social biography we can note an early marriage, followed by a divorce (when that was still condemned by the mores of the epoch); his resignation after a few years of work at the U.S. Coast Survey; a tense relationship at Johns Hopkins University, where he taught logic part time between 1879 and 1884, ending with a layoff; and, eventually, his withdrawal to Milford (Pennsylvania), where he led a strapped existence by the end of his life, living on reviews, various articles he wrote, and the financial support of his friends, especially W. James.[30]

Interestingly enough, his complex personality and the breadth of his preoccupations mean that the perceptions and classifications of Peirce vary. In the course of his life, Peirce was first thought of as a chemist (in 1863 he published *The Chemical Theory of Interpenetration*); then, between 1899 and 1909, he was considered a professor and an engineer; from 1910, his grand merits in the area of logic were recognized and only after his death was he to be rediscovered as a philosopher[31] and considered the father of semiotics.

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[28] C. Hartshorne states, for example, "He was the most scientifically trained philosopher I'd ever read; in some ways much closer to concrete experimental science than Whitehead." I. C. Lieb, "Charles Hartshorne's Recollections of Editing the Peirce Papers: An Interview by Irwin C. Lieb," *Transactions of the Charles S. Peirce Society* 6 (1970): 149–159.

[29] See the later section of this chapter, "The 'Fixation of Beliefs' and the 'Settlement of Opinions.'"

[30] The reference work on Peirce's biography is Brent's *Charles Sanders Peirce*.

[31] Fisch, "Introduction," WP 1: xxi; see also *Semnificaţie şi Actiune*, 6.

Several periods in the evolution of Peirce's thought[32] have been determined:

- His confrontation with the philosophical tradition (1855–1871);
- The institution of pragmatism (1871–1883);
- The elaboration of "the architecture of sciences" (1883–1902);
- The proposition of pragmaticism (1902–1914).

The fact that his first period was one of confrontation with the philosophical tradition shows that the pragmatic philosophy, which may be called the first typically North American philosophical product, emerged not out of nothing but rather in relation to, albeit not in direct continuity with, the grand continental philosophical tradition. Pierce delimited himself from Aristotle and Kant by delivering a new system of categories; he reexamined the issue of universals by invoking William Ockham and John Duns Scott; he delimited himself from the English empiricism of David Hume, George Berkeley, and John Stuart Mill; as for the issue of the possibility of knowing, he critiqued Kant's agnosticism, Descartes' *dubito*, and Gottfried Leibniz's definitionism.[33]In phenomenology, he rejected the idea of a pure phenomenology of the spirit, as in Georg W. F. Hegel, only to propose his own phenomenology called phaneroscopy,[34] which dealt with the formal elements of the phenomena – *phaneron*.[35]

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[32] K. O. Apel, "Charles S. Peirce: From Pragmatism to Pragmaticism," *Contemporary Sociology* 11, No. 6 (Nov. 1982): 699–700.

[33] "Nothing new can ever be learned by analyzing definitions. Nevertheless, our existing beliefs can be set in order by this process, and order is an essential element of intellectual economy, as of every other," CP 5.392 (in "Cum sa facem ca ideile sa ne fie clare"); see *Semnificaţie şi Actiune*, 133–134.

[34] CP 1.284. On this topic, see also J. Feibleman, "Peirce's Phaneroscopy," *Philosophy and Phenomenological Research* 1, No. 2 (Dec. 1940): 208–216.

[35] Peirce defines the *phaneron* in more than one way: "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,"