This is the manuscript for the chapter " The Riddle of the Sphinx Answered: On how C. S. Peirce's Transdisciplinary Semiotic Philosophy of Knowing Links Science, Spirituality and Knowing, chapter two in Tandy, C (ed.)(2014). Death and Anti-Death, Volume 12: One Hundred Years After Charles S. Peirce (1839-1914), Ann Arbor MI: Ria University Press.

The riddle of the Sphinx answered: On how C. S. Peirce's transdisciplinary semiotic philosophy of knowing links science and spirituality[1]

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Introduction[2]

Husserl wrote in *The Crisis of European Sciences and Transcendental Phenomenology* (1970) that the beginning of Galilean science – where models are related to a mathematical ideal world – changed the role of philosophy as the queen of all sciences fundamentally. Positivism and analytical philosophy later tried to get rid of all traditional metaphysical thinking of the meaning of human life and its place in the Cosmos. Science made its own – from a human subjects' point of view – unembodied meaningless mathematical metaphysics, not at least through the mathematizing of modern logic. Cognitive science later attempted to produce a transdisciplinary science based on the objective definition of information.[3]

Though a contributor to the development of modern logic and science, C.S. Peirce, through inventing a semiotics that embraced phenomenology, tried to heal the split Husserl saw. Philosophy aims primarily at the kind of knowledge that gives unity and system to the whole body of human, social and natural basic sciences through a critical examination of the grounds of our convictions, prejudices, and beliefs. Where Husserl wanted to heal the split he observed through his pure phenomenology, Peirce integrated his semiotics with a pure mathematical analysis of phenomenology and the coining of three new basic categories (Esposito, 1980), and

[1] I have chosen the transcultural and trans-religious concept of spirituality, because Peirce did not deal with organized religion and its effects on law and power as such. He was interested in the existential aspect of knowledge and meaning as well as the possible ontologies of his semiotic process philosophy of science.

[2] I am also using the classical Peirce scholar reference system, where **CP** refers to Peirce, C.S. (1994 [1866-1913 and 1931-35]): *The Collected Papers of Charles Sanders Peirce.* **SS** refers to Peirce, C.S. 1977. *Semiotics and Significs*. Ed Charles Hardwick. Bloomington IN.: Indiana University Press. **EP**: Peirce, C.S. 1998. *The Essential Peirce*. Volume 1 and 2. Eds. Peirce edition Project. Bloomington IN.: Indiana University Press. **W**: Peirce, C.S. (1982-). *The Writings of Charles S. Peirce: A Chronological Edition* Volumes 1–6, take the form W n. m. where n and m indicate volume and page number respectively. As this book is not primarily aimed for Peirce specialists, I bring a substantial amount of original quotes as the basis of my arguments.

[3] Recently there has been attempts to naturalize Husserlian phenomenology (Petitot et. al. 1999) into a cognitive science framework – in my view – with no luck, as it violates the Husserlian foundation in order to do so, and then misses the point.

considered logic to be the study of the essential nature of signs. Science is driven by the ethics of finding the truth and as such, in the end, it is a religious search, since Pierce has integrated phenomenology with ethics and aesthetics in his theory of science. This sets him squarely apart from logical positivism.

Peirce's philosophical work is famous for the transdisciplinary semiotic framework its philosophical basis makes possible (Brier 2012). It is a bit more controversial that this foundation also suggests a new understanding of science and religion and the relation between them, which transcends the usual way we separate these matters in the West since the Romantics (Sharma 2009). In 1893, Peirce wrote a paper with the title "The Marriage of Religion and Science" where he suggested that a true religion of love like Christianity would also love truth, and therefore pursue it through science, and therefore undergo a necessary dynamic development in a process of integration of new knowledge.

Peirce wanted to solve the riddle, expressed in Emerson's[4] poem *The Sphinx* ("Who taught thee me to name? I am thy Spirit, yoke-fellow. Of thine eye I am the eyebeam. Though art the unanswered question"[5]), of what the place and nature of man's role is in the universe and of how his knowing is possible at all and what its role is in the development of the Cosmos.

Peirce attempts a new way of answering Kant's basic question in the *Critique of Pure Reason*: "What can we know?" and "What may we hope?". Peirce saw as his primary task to develop a comprehensive metaphysical and epistemological system in which a new theory of categories, developed after Kant and Hegel, was defined in a completely new way (Esposito 1980). His triadic category theory was connected to a dynamic triadic web of semiotics viewed as the dynamics of objective mind (Raposa 1989, p. 146).

Deely (2001) writes that Peirce is not only a modern in his critique of Kant's philosophy and in his development of it, but that Peirce may also be the first true postmodern scholar and philosopher through his dynamic web theory of triadic dynamic sign relations not based on transcendental egos. This is because Peirce's pragmaticist semiotics attempts to bridge the gap between natural sciences and humanities by combining a phenomenological approach with an evolutionary and realistic understanding of nature and society in the development of a new transdisicplinary and evolutionary theory of meaning and logic. About logic Peirce wrote:

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[4] Ralph Waldo Emerson was the most influential of those radical thinkers and writers of the New England Transcendentalists (1830s-1850s) in Concordia. His book *Nature* (1836) was a systematic exposition of transcendental philosophy where he argued for a direct relationship with God and nature derived from his concept of the Over-Soul. Some early Unitarians had turned away from unforgiving Calvinism and started to preach a more humanistic and socially conscious form of religion. These liberal Unitarians around Harvard between 1805 and 1861 (start of civil war) represented a special form of Christian Enlightenment (Howe 1970 Introduction). This movement paved the way for the Transcendentalists' view of God. The Transcendentalists, among other, read Fichte, Schleiermacher, Hegel, Schelling, Goethe, and Coleridge, Carlyle, Wordsworth, and the Swedish mystic Emanuel Swedenborg; as well as the sacred texts of the Vishnu Purana, the Upanishads, and the Bhagavad-Gita. But there was a spilt between the empiricist and intuitionist view of knowledge among them. It is my view that Peirce through his pragmaticist semiotics suggested a way to unite these two hostile epistemologies.

[5] Line 9-12). http://poetry.eserver.org/Emerson%28Sphinx%29.html . See Nöth (2014) for a good discussion of the significance of this poem.

> Logic is not the science of how we do think; but, in such sense as it can be said to deal with thinking at all, it only determines how we ought to think; nor how we ought to think in conformity with usage, but how we ought to think in order to think what is true." (CP 2.52)

As such Peirce viewed logic as a normative science on par with ethic and aesthetics, with only phenomenology and mathematics as more foundational when it came to building a metaphysical framework to solve man's cognitive and communicatory riddle.

Also the philosopher Ferdinand Schiller dealt whit this enigma in the book *Riddle of the Sphinx* (1891)[6] in Peirce's lifetime. The problem is how to describe man within a scientific cosmogony and as an existential creature, at the same time. One of Peirce's most famous articles is titled: *A Guess at the Riddle.* Here is a quote from Peirce of his attempt to make such a new vision through his new basic philosophical categories (elements) after Kant and combine that with an alternative scientific cosmogony to the mechanistic view of Galilean and Newtonian physics, namely that of creation from chaos:

> … three elements are active in the world: first, chance; second, law; and third, habit-taking.
>
> Such is our guess of the secret of the sphynx. To raise it from the rank of philosophical speculation to that of a scientific hypothesis, we must show that consequences can be deduced from it with more or less probability which can be compared with observation. We must show that there is some method of deducing the characters of the laws which could result in this way by the action of habit-taking on purely fortuitous occurrences, and a method of ascertaining whether such characters belong to the actual laws of nature.
>
> The existence of things consists in their regular behavior….. Not only substances, but events, too, are constituted by regularities. The flow of time, for example, in itself is a regularity. The original chaos, therefore, where there was no regularity, was in effect a state of mere indeterminacy, in which nothing existed or really happened. (CP 409-11)

Peirce was nursed in logic and mathematics by his father Benjamin Peirce, who was a famous mathematical and cosmological researcher. Peirce himself was educated as a chemist and worked as an empirical and experimental physicist for a long period of his life. He was a well-read philosopher and influenced by Unitarianism's aim of using science as well as theology in a harmonic way in the search for a natural moral. It is important to understand that Peirce's conception of God, which he holds in common with his father Benjamin and brother, James, as well as numerous other nineteenth century "Liberal Unitarians" is different from most other Christian movements. The early Unitarianism from Salem and Boston of the 18th and 19th century involved an attempt to reconceive the notion of "God" as compatible with enlightenment through science (Howe 1970). Thus, a worldview with harmony between ethics, logic, evolution, and spirituality emerged before C.S. Peirce was born.

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[6] Ferdinand Canning Scott Schiller (1864-1937), German-British philosopher, had a philosophy rather similar to the pragmatism of William James.

The Peirce family represents a century of intellectual excellence and enlightenment at Harvard (Howe 1970). C. S. Peirce was representative of a period of American Enlightenment that was later oppressed by religious conservatism and is sadly mostly forgotten now. The Peirce family was also acquainted with transcendentalists like Emerson, who was considered a liberal Unitarian[7] and who furthermore was influenced by the Perennial philosophical view of a common mystical ground of all religions, including Buddhism and Vedic teachings[8]. They were all interested in Indian philosophy. There are several books on this (Christy 1932, Jackson 1981, Lavan 1984). Thus the Peirce family does not distinguish between the principal goal of theology and science. "To believe in a god at all, is not that to believe that man's reason is allied to the originating principle of the universe?" (CP 2.24) wrote Peirce. This idea of an inner connection is an important way of explaining how it is possible that man can know anything about the world or Kant's "Ding an sich". On this basis Peirce tried to solve the riddle by founding a new epistemology and philosophy of science:

> It was in the desperate endeavor to make a beginning of penetrating into that riddle that on May 14, 1867, after three years of almost insanely concentrated thought, hardly interrupted even by sleep, I produced my one contribution to philosophy in the "New List of Categories" in the Proceedings of the American Academy of Arts and Sciences, Vol. VII, pp. 287-298. Much as I would like to see Hegel's list of categories reformed, I hold that a classification of the elements of thought and consciousness according to their formal

[7] In the famous article "A neglected argument for God" Peirce writes in the spirit of such naturalized phenomenological and pragmatic view of the sacred. "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). It is important in this connection to note that he Unitarians emphasized the use of logic and reason to understand scripture.

[8] As an example of his knowledge and inspiration from the Transcendentalists Peirce wrote the following: "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 role in the drama of creation, and so far as he loses himself in that role, – no matter how humble it may be, – so far he identifies himself with its Author." (CP 7.572). See also Bishop 1981 on Peirce and Buddhism and Lavan 1977 on the Unitarians' relation to Vedic thinking, especially Advaita Vedanta as missionaries in India.

> structure is more important. …I examine the phaneron[9] and I endeavor to sort out its elements according to the complexity of their structure. I thus reach my three categories.
>
> (CP 8.213)

On this extraordinary interdisciplinary background including phenomenology he created not only a transdisciplinary process-philosophy framework for a new scientific cosmogony, but also an existential philosophy drawing on a trans-religious view of the relation between the development of man, science, the meaning of life and the cosmos. Here he was influenced by the new development of symbolic logic (Lewis 1918/60) and the nature philosophy of Schelling (Ejsing 2007, Bisanz, 2009, Brent, 1998, Niemoczynski, 2011).

Peirce's semiotic process-philosophy of knowledge explicitly and interestingly goes beyond material deterministic mechanicism as well as pure chance indeterminism and Cartesian dualism. Thus it needs an alternative metaphysical foundation for the development of knowledge and understanding through science. This was possible for Peirce because he created his pragmaticist[10] semiotic and transdisciplinary framework of cognition, communication and knowledge development through the launching of three new philosophical categories. He wrote:

> Among the many principles of Logic, which find their application in Philosophy, I can here only mention one. Three conceptions 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. They are conceptions so very broad and consequently indefinite that they are hard to seize and may be easily overlooked. I call them the conceptions of First, Second, Third. First is the conception of being or existing independent of anything else. Second is the conception of being relative to, the conception of reaction with, something else. Third is the conception of mediation, whereby a first and second are brought into relation. To illustrate these ideas, I will show how they enter into those we have been considering. The origin of things, considered not as leading to anything, but in itself, contains the idea of First, the end of things that of Second, the process mediating between them that of Third. … In psychology Feeling is First, Sense of reaction Second, General conception Third, or mediation. In

[9] "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). Furthermore: "There is nothing quite so directly open to observation as phanerons; and since I shall have no need of referring to any but those which (or the like of which) are perfectly familiar to everybody, every reader can control the accuracy of what I am going to say about them. Indeed, he must actually repeat my observations and experiments for himself, or else I shall more utterly fail to convey my meaning... What I term *phaneroscopy* is that study which, supported by the direct observation of phanerons and generalizing its observations, signalizes several very broad classes of phanerons; describes the features of each; shows that although they are so inextricably mixed together that no one can be isolated, yet it is manifest that their characters are quite disparate; then proves, beyond question, that a certain very short list comprises all of these broadest categories of phanerons there are;…." (CP 1.286)

[10] You will find many books on "American pragmatism", but although James called Peirce the father of pragmatism, Peirce grew weary of the popular, rather anti-philosophical reductionist understandings of pragmatism and coined his own term "pragmaticism". I will stay with that in accordance with his own ethics of terminology.

> biology, the idea of arbitrary sporting is First, heredity is Second, the process whereby the accidental characters become fixed is Third. Chance is First, Law is Second, the tendency to take habits is Third.
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> …. Without going into other important questions of philosophical architectonic, we can readily foresee what sort of a metaphysics would appropriately be constructed from those conceptions. Like some of the most ancient and some of the most recent speculations it would be a Cosmogonic Philosophy. (CP: 6.32-33)

In a few words we here get the whole foundational view of this new architectonic philosophy, he worked on his whole life, the details of which we shall return to again and again in this chapter. As mentioned, he ended up calling the late version of his semiotic philosophy for pragmaticism (Apel 1995). Here is a short summing up of the mature Peirce of the cosmogony necessary to support the new semiotic pragmaticist view of knowing:

> Pragmaticism, 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 pragmaticistic definition of Ens necessarium would require many pages; but some hints toward it may be given. A disembodied spirit, or pure mind, has its being out of time, since all that it is destined to think is fully in its being at any and every previous time. But in endless time it is destined to think all that it is capable of thinking. Order is simply thought embodied in arrangement; …Pure mind …appears as having a character related to the habit-taking capacity, just as super-order is related to uniformity. Now imagine, in such vague way as such a thing can be imagined, a perfect cosmology of the three universes. It would prove all in relation to that subject that reason could desiderate; and of course all that it would prove must, in actual fact, now be true. But reason would desiderate that that should be proved from which would follow all that is in fact true of the three universes; and the postulate from which all this would follow must not state any matter of fact, since such fact would thereby be left unexplained. (Peirce CP 6.490)

We see here one of Peirce's short summing ups of his cosmogony and how he tries to make a framework that avoids Descartes dualism between mind and matter. There have been important scholars like Goudge (1950) that argued extensively for the lack of integration of the scientific and the existential aspects of Peirce's philosophy,[11] and there are many that are skeptical of his metaphysics. Short (2007), for one, argues that Peirce does not have any metaphysics that is to be taken seriously. But Hauser is doing an impressive work – for instance Hauser (2014) – to make a reasonable interpretation of the relation between modern science and Peirce's philosophy of the symbol and his Cosmogony. In this chapter I want to demonstrate that Short is wrong. Peirce has a metaphysics and he worked on it all his active life, which we can see from many quotes.

Goudge named the two antagonistic aspects of Peirce's philosophy the "naturalist" and the "transcendentalist" aspect of his thinking. Personally, I think Goudge underestimated the Unitarian influence on Peirce from his father

[11] Se Anderson's (2004) explicit arguments against Goudge view.

Benjamin Peirce (1881). Here, the two sides merged in a view on *the ideality of the Physical sciences* based on the understanding of classical physics and cosmogony. Therefore, I much more agree with Richard B. Mullin, who writes about James, Peirce and Royce's pragmatism:

> They created an interlocking, although conflicting, constellation of worldviews that integrate the progress of science with deeper and more general human needs. Nevertheless, the problems which they addressed continue to plaque industrial and post-industrial society, and I will argue that these philosophers' insights continue to be part of the solution of our problem.
>
> Mullin (2007: xii)

Peirce took over this unified worldview of science and spirituality from his father and made a new connection of a highly original kind between modern physics, evolutionary thinking and a theory of the absolute through his semiotic philosophy and new categories. Personally, I find that this is the most interesting and far-reaching part of Peirce's work. It shows him as a true philosopher.

It is interesting that from the 1970's we have had in the West a similar influence from Eastern philosophy as the one the Transcendentalists represented more than a hundred years earlier: 1. through spiritual New Age thinking as a new form of transcendentalism, and 2. a new view of the scientific worldview through the development of quantum mechanics and quantum field theory as well as special and general relativity (Kuhlmann 2006); 3. attempts to interpret them as complementary parts of a new holistic worldview. Here Fritjof Capra's Book *The Tao of Physics* was the first attempt to make such a new holistic thinking influenced by Eastern philosophy, although in a popular science form that was not taken seriously in scientific and philosophical circles. But David Bohm's *Wholeness and the Implicate order* from 1980 was a more serious attempt and therefore more directly scientifically criticized. But even now in the 21'st century we still find a scientific and philosophical development of this new integrative thinking in the *Towards a science of Consciousness* movements with its annual conferences and it's *Journal of Consciousness Studies*. Both are influenced by Stuart Hameroff, who, with Roger Penrose (2011),[12] has worked on a quantum theoretical theory of consciousness for decades.

The title of the paper quoted in note 12 is "Consciousness in the Universe". Its philosophy is cosmological as well as cosmogonical like Peirce's. My critique here is – after having been fascinated by these attempts of integrated philosophy for many years (Brier 2008, 2010, 2012) – that Capra, Bohm, Penrose and Hameroff and

[12] The abstract of the 2011 paper says: "The nature of consciousness, its occurrence in the brain, and its ultimate place in the universe are unknown. We proposed in the mid 1990's that consciousness depends on biologically 'orchestrated' quantum computations in collections of microtubules within brain neurons, that these quantum computations correlate with and regulate neuronal activity, and that the continuous Schrödinger evolution of each quantum computation terminates in accordance with the specific Diósi–Penrose (DP) scheme of 'objective reduction' of the quantum state (OR). This orchestrated OR activity (Orch OR) is taken to result in a moment of conscious awareness and/or choice. This particular (DP) form of OR is taken to be a quantum-gravity process related to the fundamentals of spacetime geometry, so Orch OR suggests a connection between brain biomolecular processes and fine-scale structure of the universe."
http://journalofcosmology.com/Consciousness160.html

Towards a science of Consciousness on average do not make it into a plausible philosophic and scientific framework because they are not using Peirce's triadic phenomenological pragmaticist semiotics in their attempt to unite a scientifically-based naturalism and the transcendentalist perennial philosophy's naturalism. They cannot get out of their implicit positivistic dualisms.[13] I much more agree with Mullin, when he writes:

> The pragmatists, by contrast, integrated their science with philosophy by not only being intimately knowledgeable of science, but by developing a method that embrace all forms of knowing including science and philosophy. Unlike the positivists, the pragmatists integrated their method with the traditional philosophical problems such as ethics and metaphysics. The development of ethics and metaphysics open up the spiritual dimension of life. (Mullin 2007:149-150)

That spiritual tendency is still around, but also abhorred by many "real scientists", partly because they see science as an alternative to religion and therefore consider religion superfluous (Dawkins 2006), where my view is that we deal with two complementary aspects of knowledge and reality (see also Ashley and Deely 2012). Peirce's pragmaticist philosophy makes possible a view of *Wissenschaft*,[14] which sees it and religion within the same transdisciplinary knowledge framework and still distinguish them as different, instead of considering only one of them to create objective knowledge. The problem is if the price of such a new transdisciplinary understanding of *Wissenschaft* within a philosophical framework that contains a view of spirituality, is reasonable and consistent. Many – like Goudge – think that this aspect of Peirce's pragmaticism is too close to Hegel and Schelling's objective idealisms (See also Hartshorne and Reese 1953: 269) to be compatible with the (physical) realism demanded of modern natural sciences. But it is my view that Peirce is combining his theory of logic as semiotic with an evolutionary theory creating a philosophy different from Hegel and improving considerable on Schelling, who was an important influence on his philosophy.

Stjernfelt (2014) points out that one of the most important lessons to take from Peirce's semiotics is the vast reorientation of the whole domain of sensation, perception, logic, reasoning, thought, language, images etc. towards the chain of *reasoning as its uniting primitive phenomenon*, which is so crucial to his pragmaticism. The point of pragmaticism is that this development of reasoning may be formally described, independently of the materials, in which it may be implemented. This view implies that propositions are not primarily entities of language, nor do they presuppose any conscious "propositional stance". Consciousness and language should rather be seen as scaffolding, serving and increasing reasoning, which is one of the most important overall selecting factors during evolution, Stjernfelt argues. Thus, language, images, perception etc. should be re-conceptualized for the roles they may play in the chain of propositions that constructs the reasoning process. Here is a quote that makes it clear how Peirce sees semio-logical processes permeating all levels of living systems:

[13] The philosopher of science Roy Bhaskar (2000, 2002 a,b,c,d,e) does not seem to commit these mistakes when he makes an attempt to integrate his Western and Indian philosophical heritages in a new transdisciplinary framework.

[14] The concept 'Science' has the tendency in some circles to be understood only as natural sciences and as such close to a positivistic reductionist view. The German 'Wissenschaft' is born inter- and transdisciplinary, encompassing the natural, life, technical, social and human sciences, so I choose to use that term.

> The cognition of a rule is not necessarily conscious, but is of the nature of a habit, acquired or congenital. The cognition of a case is of the general nature of a sensation; that is to say, it is something which comes up into present consciousness. The cognition of a result is of the nature of a decision to act in a particular way on a given occasion. In point of fact, a syllogism in Barbara virtually takes place when we irritate the foot of a decapitated frog. The connection between the afferent and efferent nerve, whatever it may be, constitutes a nervous habit, a rule of action, which is the physiological analogue of the major premiss. The disturbance of the ganglionic equilibrium, owing to the irritation, is the physiological form of that which, psychologically considered, is a sensation; and, logically considered, is the occurrence of a case. The explosion through the efferent nerve is the physiological form of that which psychologically is a volition, and logically the inference of a result. When we pass from the lowest to the highest forms of inervation, the physiological equivalents escape our observation; but, psychologically, we still have, first, habit--which in its highest form is understanding, and which corresponds to the major premiss of Barbara; we have, second, feeling, or present consciousness, corresponding to the minor premiss of Barbara; and we have, third, volition, corresponding to the conclusion of the same mode of syllogism. (CP 2.711) .

Ontologically it means that evolution is neither completely random nor completely mechanical, but is a development of the reasoning power of the universe. This is a move away from the reductionist pure physicalism into a broader philosophical framework that can encompass a transdisciplinary view of Wissenschaft, man and universe. As Wittgenstein wrote:

> "Philosophers constantly see the method of science before their eyes and are irresistibly tempted to ask and answer questions in the way science does. This tendency is the real source of metaphysics and leads the philosopher into complete darkness."(Wittgenstein 1933/58: p18,).

Wittgenstein had a pragmatist, process view of language, but did not develop a full pragmaticist semiotics based on relational logic like Peirce.

It is important to be aware that interaction as such is not relation in itself. Relation is what arises from and continues after interaction has ceased. Only irreducibly triadic relation uniting three distinct terms constitutes a “sign” formally in Peirce’s semiotic paradigm. This semiotic process framework gives us an access to the meaning of nature beyond what mechanical science can provide. Peirce wrote: “Nature is a book which science interprets, and yet all its poetry which is a form and all its pathos which is a force are foreign to science”. (W 1.55)

It is Peirce’s view of the sign as a real and dynamical developing relational process that distinguishes his philosophy so much from all other philosophies that his work was not accepted as a part of the development of philosophy. The core of his idea is that there is nothing in thought or in sensation, which was not first in signs (Deely 2013 xxvii). This view is simply foundationally new in philosophy, though much of the foundational work was already done by Poinsot (Deely 2001, 2013). Peirce’s probably most famous definition of his new conception of signs is this:

> 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 stand itself to the same Object. The triadic relation is genuine, that is its three members are bound together by it in a way that does not consist in any complexus of dyadic relations. That is the reason the Interpretant, or Third, cannot stand in a mere dyadic relation to the Object, but must stand in such a relation to it as the Representamen itself does. Nor can the triadic relation in which the third stands be merely similar to that in which the First stands, for this would make the relation of the Third to the First a degenerate Secondness merely. (C.P. 2-274)[15]

The non-reducible triadic process relation that is not primarily driven by human subject's consciousness and therefore opens a foundation for a biosemiotics is foundational to Peirce's pragmaticist philosophy, integrated with his definition of the new basic categories of Firstness, Secondness and Thirdness. The Sign as an irreducible triad is a syllogism. The major premise is the Representamen relation; the minor premise is the Object relation and the conclusion is the Interpretant. This is a dynamic transformative process. It is not just a mechanical conveyor belt because the information is acted upon and 'thought about' (interpreted) from input sensation to result. It is this conception of semiosis that makes inter- and transdisciplinarity possible and does not stop with Wissenschaft but encompasses spiritual and existential knowledge. For Peirce does not start with doubt like Descartes, but with hypothetical belief. One of his early and most famous articles in *Popular Science Monthly* 12 (November 1877) is called "The fixation of belief".

Peirce's semiotics is much more complex than the basic definitions we have given here, with definitions of different types of sign and forms of reasoning. His basic three semiotic triads: qualisign-sinsign-legisign; icon-index-symbol, and rheme-dicisign-argument are meant to refer to aspects of the sign process, and most signs include several of those aspects. To Peirce the main phenomenon of semiotics is *reasoning*. Thus – as Stjernfelt (2014) points out - the whole of the semiotic machinery is developed to understand the essence of reasoning processes as chains of arguments in perception, thinking and communication. But it is also important that the semiotic logical reasoning process is also based on an aesthetical as well as an ethic perspective in Peirce's philosophy of knowing.

Pierce's philosophy uses his general definition of sign processes or semiosis based on his construction of the three categories as a way to define knowledge and truth and the understandability of the world in a way no one else has undertaken. Though science explains our material connection with the world through cosmogony and evolution, it has so far not been able to explain the conundrum of knowledge. How is it that we can know any true aspects of the world? What do the natures of man and the world have to be like for this to be possible? He wrote about how signs establish the human possibility of knowledge through science, or be it the truth of the divine secrets of the universe as they for instance are told by a non-human creature like the archangel Gabriel:

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[15] Peirce further explains: "A sign stands for something to the idea which it produces, or modifies. Or, it is a vehicle conveying into the mind something from without. That for which it stands is called its object; that which it conveys, its meaning; and the idea to which it gives rise, its interpretant. The object of representation can be nothing but a representation of which the first representation is the interpretant. But an endless series of representations, each representing the one behind it, may be conceived to have an absolute object at its limit. The meaning of a representation can be nothing but a representation. In fact, it is nothing but the representation itself conceived as stripped of irrelevant clothing. But this clothing never can be completely stripped off; it is only changed for something more diaphanous. So there is an infinite regression here. Finally, the interpretant is nothing but another representation to which the torch of truth is handed along; and as representation, it has its interpretant again. Lo, another infinite series." (CP 1.339)

> That truth is the correspondence of a representation with its object is, as Kant says, merely the nominal definition of it. Truth belongs exclusively to propositions. A proposition has a subject (or set of subjects) and a predicate. The subject is a sign; the predicate is a sign; and the proposition is a sign that the predicate is a sign of that of which the subject is a sign. If it be so, it is true. But what does this correspondence or reference of the sign, to its object, consist in? The pragmaticist answers this question as follows. Suppose, he says, that the angel Gabriel were to descend and communicate to me the answer to this riddle from the breast of omniscience. Is this supposable; or does it involve an essential absurdity to suppose the answer to be brought to human intelligence? In the latter case, "truth," in this sense, is a useless word, which never can express a human thought. It is real, if you will; it belongs to that universe entirely disconnected from human intelligence which we know as the world of utter nonsense.…. Now thought is of the nature of a sign. In that case, then, if we can find out the right method of thinking and can follow it out -- the right method of transforming signs -- then truth can be nothing more nor less than the last result to which the following out of this method would ultimately carry us. In that case, that to which the representation should conform, is itself something in the nature of a representation, or sign -- something noumenal, intelligible, conceivable, and utterly unlike a thing-in-itself. (CP 5.553***)***

Thus if semiotic triadic pragmaticism is correct, then there is nothing in reality we cannot know. There is no obscure Kantian thing-in-itself. Peirce's new improved categories and pragmaticist semiotics explain us philosophically and practically how true knowledge about the cosmos is possible. Peirce read, of course, Aristotle,[16] but most of all he read Kant again and again in his youth and decided from early on to make a new foundational work on categories and combined it with his ontological views of tychism, synechism and agapism, which I will explain further (below). In *One, Two, Three: Kantian Categories* Peirce starts to describe how his new philosophy of categories can be combined with his process view:

> If the universe is thus progressing from a state of all but pure chance to a state of all but complete determination by law, we must suppose that there is an original, elemental, tendency of things to acquire determinate properties, to take habits. This is the Third or mediating element between chance, which brings forth First and original events, and law which produces sequences or Seconds. (EP 1:243)

Since mechanical determinism cannot explain the novelty of evolution,[17] including the emergence of the laws of nature, Peirce was aware that we needed an alternative ontology to the mechanistic one. As physicist Lee

[16] Here is Peirce's commentary to Aristotle's categories. "Some of the most celebrated logics, however, are written from the points of view of metaphysical sects. The *Organon* of Aristotle, the title that the collection of his logical treatises received, opens with a metaphysical book, the Categories, or Predicaments, although in that same treatise Aristotle evidently bases the metaphysics upon a grammatico-logical analysis of the Greek sentence. To this book was usually prefixed the treatise of Porphyry on the Predicables. About half the scholastic works on logic are commentaries on the collection of books so formed. These works, therefore, base logic on metaphysics to some extent." (CP 2.37). Peirce wanted to base metaphysics on mathematics and phaneroscophy.

[17] "Among other regular facts that have to be explained is law or regularity itself. We enormously exaggerate the part that law plays in the universe. It is by means of regularities that we understand what little we do understand of the world, and thus there is a sort of mental perspective which brings regular phenomena to the foreground. We say that every event is determined by causes according to law. But apart from the fact that this must not be regarded as absolutely true, it does not mean so much as it seems to do. "(CP 1,406)

Smolin writes, "The Cosmological questions such as *Why these laws?* and *Why the initial conditions?* cannot be answered by a method that takes the laws and initial conditions as input." (Smolin 2014:250). But this is what modern classical physics does and therefore Smolin's work here is quite revolutionary and he is quite aware that the thought was foundational to Peirce's cosmogony and quotes him several places in the book.

One of the alternatives is to take the objective reality of time seriously, as did Prigogine (1980, 1996 and with Stengers 1984), and to start with some of kind of non-mechanical objective chance as ontologically foundational. Peirce did that long before Prigogine and called it Tychism. In his Cambridge Lectures (Peirce 1898) Peirce discusses various objections to this choice from theological and scientific researchers:

> Let me here say one word about Tychism, or the doctrine that absolute chance is a factor of the universe. (some critics) … do not perceive that that which offends them is not the Firstness in the swerving atoms, because they themselves are just as much advocates of Firstness as the ancient Atomists were. But what they cannot accept is the attribution of this Firstness to things perfectly dead and material. Now I am quite with them there. I think too that whatever is First is ipso facto sentient. (CP 6.201)

Thus Peirce's Firstness is not a part of modern scientific ontological physicalism that makes matter the ultimate reality from which everything else should be explained. Thus, he is a more radical in his philosophy than Prigogine and Smolin. This might come from his spiritual view of reality. The Firstness of chaos is not only a turmoil of possibilities, but also of emotions as qualia and therefore the basis for an objective idealist ontology and theory of evolution. Therefore, in 1892, he writes in *The Law of Mind* on his concept of Tychism:

> I have begun by showing that tychism must give birth to an evolutionary cosmology, in which all the regularities of nature and of mind are regarded as products of growth, and to a Schelling-fashioned idealism which holds matter to be mere specialized and partially deadened mind. 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 Boehm, 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)

As mentioned, for some it is puzzling that the logician, chemist scientist Perce admits an inspiration from the romantic philosopher Schelling. But – to repeat – it is one of my points here that it is this combination of logic, natural science and holistic evolutionary process philosophy that makes Peirce's semiotic pragmaticism a unique transdisciplnary framework that can encompass Wissenschaft and spirituality, without compromising any of them, that is unique for Peirce and is probably inspired by his original Unitarian background and connection with the Concord transcendentalism. But instead of – like the mechanists – starting with universal laws and

explain everything from applying them on initial conditions, Peirce sees law as the thing that needs to be explained:

> … conformity to law exists only within a limited range of events and even there is not perfect, for an element of pure spontaneity or lawless originality mingles, or at least must be supposed to mingle, with law everywhere. Moreover, conformity with law is a fact requiring to be explained; and since law in general cannot be explained by any law in particular, the explanation must consist in showing how law is developed out of pure chance, irregularity, and indeterminacy. (CP:1.407)

Thus the category of Firstness is prone to lead to Tychism, which again is necessary to establish an evolutionary ontology, and since this is going to explain cognition, communication and the possibility of truth in science, the chance of Firstness must have a mind aspect. Thus law, in a modern view of scientific law (Smolin 2013), cannot be viewed as an absolute orderliness, but only a certain degree of regularity – what Peirce calls habit taking in a cosmogony (Hartshorne and Rees 1953:352). Thus, as pure chance with the tendency to take habit, Firstness, in its total freedom, seems to be almost outside time and space, there is nothing to hinder it to go through all possible forms and therefore sooner or later also to go through a scenario with the creation of a manifest world developing atoms and things regulated by habits, which look almost as universal laws although most of them are still developing. There is therefore no reason or cause behind the creation of a manifest world from a Firstness of all possibilities other than this is a possibility among many that will be tested. These potentialities or virtual qualities manifest themselves in concrete phenomena like force and will, which he calls Secondness. They are immediate differences and resistances between phenomena as well as things. Peirce adopts Duns Scotus' term *haecceity*[18] to designate the arbitrary here-and-nowness of existence, a person or object's this-ness, the brutal facts based on relations that in themselves cannot be explained further as an individual phenomenon.

Also here is a similarity to modern quantum mechanics, where particles-waves only have a certain probability or tendency to exist when measured.[19] That can be described very lawfully with more precision than any other physical theory we know. But the actual individual phenomena cannot be explained further. Only by measuring on huge ensamples can the law be induced. This haecceity of the individually measured particle *Peirce* identified as *pure Secondness*.

> What Scotus calls the haecceities of things, the hereness and nowness of them, are indeed ultimate. Why this which is here is such as it is; how, for instance, if it happens to be a grain of sand, it came to be so small and so hard, we can ask; we can also ask how it got carried here; but the explanation in this case merely carries us back to the fact that it was once in some other place, where similar things might naturally be expected to be. Why IT,

[18] "Indeterminacy, then, or pure firstness, and hæcceity, or pure secondness, are facts not calling for and not capable of explanation. Indeterminacy affords us nothing to ask a question about; hæcceity is the ultima ratio, the brutal fact that will not be questioned. But every fact of a general or orderly nature calls for an explanation; and logic forbids us to assume in regard to any given fact of that sort that it is of its own nature absolutely inexplicable. This is what Kant calls a regulative principle, that is to say, an intellectual hope." (CP 1. 405)

[19] http://www.sciencedaily.com/releases/2014/08/140805132526.htm

> independently of its general characters, comes to have any definite place in the world is not a question to be asked; it is simply an ultimate fact. (CP 1.405)

Peirce's view of haecceities as being unexplainable as singular events is thus close to the modern understanding of quantum events. Quantum physics cannot deduce the singular event, but can only make a probability model from thousands of them. This would be Thirdness in Peirce's paradigm. But in modern quantum physics, there is an undetermined spontaneity of the single event that is not explainable in itself from a scientific point of view and quantum mechanics thereby breaks with classical deterministic mechanicism in a way compatible with Pierce's philosophy.

For Peirce the problem is that empiricist philosophy says that our ideas come from direct experience of things. Peirce points out that it amounts to the claim that individual pieces of data can be known directly in themselves, that is, without any knowledge of associated concepts. It is a sort of logical positivism or modern dataism. But this is not so in Peirce's *synechism* where the world's ontological foundation is a plenum, or a field, where everything is connected to everything else in a hyper-complexity like the one we find in the mathematical line where a new cut can always be inserted between two points, no matter how refined they are defined (Robertson 2004). It also means that all knowledge is fallible – it cannot be proven true. Truth is a possibility through science, an ideal limit. It is the settling of the irritation of doubt, but, with the means we have, truth will always be provisional. In Peirce's words,

> The principle of continuity is the idea of fallibilism[20] 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 …. (Peirce CP 1.171)

As Kultgen (1959-60) argued, it is important that both Peirce and Whitehead (1929) thus deny Kant's (1981/1990) distinction between nature and freedom. To Peirce, nature has spontaneity and pure chance at its basis in Firstness and reasonability in Thirdness. Peirce denies the distinction between the phenomenological and the noumenal, understood as "the-thing-in-itself", because this idea of the incognizable appears as a null-term of theoretical and practical thought. For Peirce, the real is wholly open to our pragmatic observation and thinking, and there is no absolute difference between objects of theoretical and practical thought. Metaphysics is seen as an observable ideal limit of empirical enquiry (Kultgen, 1959-60).

The best way to explain cosmogony and evolution is as a dynamic interaction between the three categories or universes as Peirce also calls them.[21] Neither of the categories can be reduced to the other, but cosmogonically viewed, they are derived from each other.

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[20] In his *Objective knowledge*, Karl Popper (1971 p.212) viewed Peirce as "one of the greatest philosophers of all times". Popper's fallibilist evolutionary philosophy of science is very close to the essence of Peirce's theory.

[21] One might also suggest that they are *different* levels of reality that can only be connected through the triadic dynamics of signs.

Since Firstness is a state of absolute possibility and radical indeterminacy as close to nothingness as possible, it is an absolute permissibility with no cause outside itself. From here, Secondness emerges as one of many possibilities as difference, other, individuality, limit, force and will. Thirdness is the mediating habit-taking aspect of evolution that contributes to the creation of an emergent order somewhat different from Hegel's dialectical evolution and as well the dialectical materialism of Frederick Engels (1873-1886) *Dialectics of Nature*. In contrast to Engels, Peirce's categories also have a phenomenological aspect. Peirce writes in 1907:

> Firstly come "firstnesses," or positive internal characters of the subject in itself; secondly come "secondnesses," or brute actions of one subject or substance on another, regardless of law or of any third subject; thirdly comes "thirdnesses," or the mental or quasi-mental influence of one subject on another relatively to a third. (CP 5.469)[22]

The philosophical contemplation of the relation between science and belief and therefore also spirituality has to go through stipulations of ontology, epistemology and logic, as well as anthropology of the nature of the human observer, thinker and actor. The categories also act a as metaphysical basic concepts in the article "A Guess at the Riddle":

> We have seen that it is the immediate consciousness that is preeminently first, the external dead thing that is preeminently second. In like manner, it is evidently the representation mediating between these two that is preëminently third. Other examples, however, should not be neglected. The first is agent, the second patient, the third is the action by which the former influences the latter. Between the beginning as first, and the end as last, comes the process which leads from first to last. (CP 1.361)

In the modern conception science created the material and mechanical vision of the universe from the Greek idea of Cosmos and Logos. It was a move that avoided the concept of the living personal God and as such also meant that God as an ontological entity was not accepted in the scientific universe. Furthermore, the classical natural sciences do not have concepts of emotional experience, qualia of sense experience and meaning theoretically defined in their paradigmatic framework; rather, they mainly worked with logical and empirical truth relations. Classical physics established a deterministic machine metaphor of a closed universe governed by natural universal laws; for some these could be the work of God creating the world in a deistic theology.

To this day, cosmologists within physics talk about "the thoughts of God" as a metaphor for the basic laws in a stable universe. But God does not belong in the natural scientific paradigm's ontology any longer. Instead modern Heideggerian and Husserlian phenomenology, based on consciousness and language, has developed a phenomenological analysis of our 'life world'. This is seen as being "before" the scientific world view's specialized knowledge about the world "outside" of our life world. The modern mechanistic ontology of science leaves us – as already Monod (1972) concluded in his analysis of a mechanical molecular biology – as "Gypsies on the boarder of the universe". Peirce agrees with Monod that the mechanical view is insufficient as philosophical transdisciplinary ontology and epistemology even in an evolutionary setting. Peirce writes:

> "[T]he 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

[22] Peirce defined quasi-minds as a logically interconnected series of signs.

> experience that show us this; but that which has opened our eyes to these facts is the principle of fallibilism." (CP 1.162).

We do not have absolute certain knowledge about absolute law, as many classical physicists tended to think. This opens for a much wider understanding of the complexity and meaningfulness of – not least – human reality, if one wanted to build a philosophy encompassing both science and conjectures of meaning, such as religious systems and philosophies. Peirce was an architectonic-systematic philosopher (Murphey 1961) and can be compared to Aristotle in breadth, to Kant in modern transcendental thinking, to Hegel and Schelling in evolutionary vision, and to Whitehead (1929) in process philosophy. The following quote can be seen as an attempt to take up Monod's problem of how science can place man consistently in a meaningful cosmogony:

> 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).

Though Peirce was groomed by his famous father in mathematics and logic, he was educated and trained as a chemist, had studied biology with the Swiss-born biologist and geologist, Louis *Agassiz* Agassi (Ketner, 1994) and had worked experimentally within the physical sciences in the U.S. Coast Survey. He was also inspired by the pre-Socratic philosophers and his father's work on cosmogony (Peirce, B. 1881) in his attempt to understand the universe as a whole (CP4.375). Later, he was further inspired by the scholastic philosophers, not the least Duns Scotus (Boler 1963, Haack, 1992).

The new foundation was his self-invented triadic semiotics through which he suggested viewing the universe as a huge argument and man as a developing symbol (CP 5.119), as one way of aligning the two natures of man and cosmos to make exchange of knowledge between them possible. Already in 1862, he points out that no modern science is the study of the material alone but is rather studying:

> … the immaterial contained in the material. … Now the meaning of a thing is what it conveys. Thus, when a child burns his finger at the candle, he has not only excited a disagreeable sensation, but has also learned a lesson in prudence. Now the mere matter cannot have given him this notion, since matter has no notions to give. Who originated it then? It must be that this thought was put into nature at the beginning of the world. It must have been meant because it was conveyed. Further, what is the necessary condition to matter's conveying a notion. It is that it shall present a sensible and distinct form. … It must be sensible to be anything to us and it must be distinct or distinguished to be a form to us…. Thus it is the form of a thing that carries its meaning. But the same thing conveys different meanings to different faculties. So there are different orders of meaning in nature. The poet with his esthetic eye reads the secret of the sea. ... The man of science with the eye of reason reads the secret of Nature as a system. (W 1 50)

How can man read the secrets of nature? In CP 5.488 Peirce makes a crucial distinction; namely that: "all this universe is perfused with signs, if it is not composed exclusively of signs". Only the latter idea implies Peirce's thesis that signs are not restricted to the living world, in the sense that semiosis is also at work already in the pre-

living development of the universe. This is what John Deely calls physiosemiosis (Deely 1997, 2006). The idea is not pansemiotic, but that signs develop within cosmogony, as part of the development of the universe's reasoning capability. Thus, it accepts the physical description of the processes in the early universe before life emerged, but it is not physicalist, as it is encompassed in a greater semiotic cosmogony. This is not pansemiotics since it only implies that the possibility of semiosis lies in physics, – but not that those possibilities are realized in all physical processes. Physiosemiosis explores the question of exactly where and how the possibility of semiosis lies in physics (Deely 1997, 2006). This means that the overall view of evolution is the connection between man and the universe. The connection between outer and inner nature was driven by the universal development of semiotic reasoning in cosmogony (CP 1.615; Sørensen et al: 106-117).

Overall, this gives Peirce the alternative view of Cosmogony expressed in "A Guess at the Riddle" that might be compatible for both science and religion if they accept the semiotic pragmaticist framework. He starts in the usual thycistic way with absolute change with the tendency to take habits. Then he writes about the development of the universe in a way that is compatible with the modern theories of multiverses (Carr 2007):

> Our conceptions of the first stages of the development, before time yet existed, must be as vague and figurative as the expressions of the first chapter of Genesis. Out of the womb of indeterminacy we must say that there would have come something, by the principle of Firstness, which we may call a flash. Then by the principle of habit there would have been a second flash. Though time would not yet have been, this second flash was in some sense after the first, because resulting from it. Then there would have come other successions ever more and more closely connected, the habits and the tendency to take them ever strengthening themselves, until the events would have been bound together into something like a continuous flow. We have no reason to think that even now time is quite perfectly continuous and uniform in its flow. The quasi-flow which would result would, however, differ essentially from time in this respect that it would not necessarily be in a single stream. Different flashes might start different streams, between which there should be no relations of contemporaneity or succession. So one stream might branch into two, or two might coalesce. But the further result of habit would inevitably be to separate utterly those that were long separated, and to make those which presented frequent common points coalesce into perfect union. Those that were completely separated would be so many different worlds which would know nothing of one another; so that the effect would be just what we actually observe…
>
> Pairs of states will also begin to take habits, and thus each state having different habits with reference to the different other states will give rise to bundles of habits, which will be substances. Some of these states will chance to take habits of persistency, and will get to be less and less liable to disappear; while those that fail to take such habits will fall out of existence. Thus, substances will get to be permanent.
>
> In fact, habits, from the mode of their formation, necessarily consist in the permanence of some relation, and therefore, on this theory, each law of nature would consist in some

> permanence, such as the permanence of mass, momentum, and energy. In this respect, the theory suits the facts admirably. (CP 1.412-15)

Adding to this construction of categories and cosmogony, Peirce also establishes his metaphysical framework based on pure mathematics,[23] phenomenology, aesthetics, ethics and logic as semiotics. He writes in his *Cambridge Lectures* (Peirce 1898): "metaphysics must draw its principles from logic, … logic must draw its principles ... from mathematics" (Peirce 1992:123). Since all cognition, thinking and communication is done with and through signs, and since the processes in the natural environment (geology and ecology) work dynamically on sign processes, there is no reason to suppose any limits to our knowledge on one hand and on the other that we know the whole truth in any precise detail. Logic is semiotics. Peirce writes:

> Logic, in its general sense, is, as I believe I have shown, only another name for semiotic (σημειωτική), the quasi-necessary, or formal, doctrine of signs. By describing the doctrine as "quasi-necessary", or formal, I mean that we observe the characters of such signs as we know, and from such an observation, by a process which I will not object to naming Abstraction, we are led to statements, eminently fallible, and therefore in one sense by no means necessary, as to what must be the characters of all signs used by a "scientific" intelligence, that is to say, by an intelligence capable of learning by experience. As to that process of abstraction, it is itself a sort of observation. CP 2.227)

Thus, it is important that Peirce's metaphysics is neither pansemiotic nor panpsychic, but based at a dynamic development of reasoning as Stjernfelt (2014) argues. He also demonstrates how Peirce's semiotic view shares an anti-psychologist understanding of cognition and communication with Frege and Husserl. Peirce writes:

> Logic will here be defined as formal semiotic. A definition of a sign will be given which no more refers to human thought than does the definition of a line as the place which a particle occupies, part by part, during a lapse of time. Namely, a sign is something, A, which brings something, B, its interpretant sign determined or created by it, into the same sort of correspondence with something, C, its object, as that in which itself stands to C. It is from this definition, together with a definition of "formal", that I deduce mathematically the principles of logic. (C.S. Peirce, NEM 4, 20–21).

Stjernfelt (2014) underlines that what set Peirce's philosophy apart from all others was that Peirce's pragmaticism was not based on the linguistic turn, but on his view that *semiotics is logic*. As dicisigns depend on neither human consciousness nor on human language, they are natural propositions, since all aspects of perception and cognition in general have the character of inference and, in the biosemiotics view, you can see the

[23] Peirce distinguished between formal logic as a mathematical branch of the science of discovery and pure theoretical mathematics as the most abstract of all sciences (*CP* 4.244, 4.263, c.1902) and he argued that the reasonings of pure mathematics had no need of any separate theory of logic to reinforce them. "… mathematics is the only science which can be said to stand in no need of philosophy, excepting, of course, some branches of philosophy itself." (CP 1.249) From his father, Peirce had the view that mathematics is the discipline that draw necessary conclusions and is its own logic. He did not see logic as a foundational science, but as one of the normative sciences like aesthetics and ethics where logic is the science of correct reasoning, as mentioned above.

development of the living system's cognitive apparatus through evolution in this way (Brier 1999, 2000, 2006, 2008d, 2011c). Peirce talks about "the great truth of the immanent power of thought in the universe" (CP 1.349).

Living systems autopoietically interact with the world they perceive semiotically and physically with the part of the world they do not perceive yet. Our and all living systems' knowledge is fallible and develops all the time through learning on an evolutionary and ontogenetic level. Thus, the core of Peirce's philosophy is semiotics. This is what sets him apart from all other philosophers in the world. Make him unique and therefore also outside main stream philosophy and mainstream science as we know it today (Deely 2001). It is the sign process of reasoning that connects our "inner" and "outer" worlds. A view that also moves Peirce away from traditional subject thinking and Kant's idea of an unknowable "Ding and sich". Peirce writes:

> Such being the nature of reality in general, in what does the reality of mind consist? We have seen that the content of consciousness, the entire phenomenal manifestation of mind, is a sign resulting from inference. Upon our principle, therefore, that the absolute incognizable does not exist, so that the phenomenal manifestation of substance is the substance, we must conclude that the mind is a sign developing according to the laws of inference. (EP I 53, 5.313)

Consequently, Peirce saw the human self as a growing symbol and the universe as a growing argument (the most complex of his sign categories)[24]. I believe that Stjernfelt (2014) is right when he argues that the dicisigns – in their form of natural propositions – are the most important connection between the two, as cognition is not necessarily conscious. But is a habit acquired through life experience or as an inherent disposition for the species acquired through evolution? The last remark is the view of biosemiotics (Brier 1999).

Thus, the conclusion is that Peirce clearly starts his semiotics in nature before the emergence of human language. Peirce developed his pragmaticist system through his final prolonged period of work before his death in 1914. Most of it can be accessed through his Harvard lectures (Peirce, 1997). It was a refined version of his original pragmatism. One of the researchers who took notice of the difference was Karl-Otto Apel. He called his book on Peirce's semiotics for *From Pragmatism to Pragmaticism* (Apel 1995). In the end, what Peirce attempted to show was that pragmaticism is the ultimate logical interpretant of signs, including divine signs, and the process of thinking. In his *Charles Peirce's Guess at the Riddle* John Sheriff (1994) states what I consider to be one of the most precise overall descriptions of Peirce's philosophy:

> It places humans in a universe of signs that connect mind and matter, inside and outside, transcendence and immanence. It gives us a theory of human and cosmic meaning that does not lead to the dead-end nothingness of pure form or to the

[24] I shall reply that the universe is a vast representamen, a great symbol of God's purpose, working out its conclusions in living realities. Now every symbol must have, organically attached to it, its Indices of Reactions and its Icons of Qualities; and such part as these reactions and these qualities play in an argument that they, of course, play in the universe – that Universe being precisely an argument. … The Universe as an argument is necessarily a great work of art, a great poem – for every fine argument is a poem and a symphony – just as every true poem is a sound argument. (CP 5.119)

> decentering of the human subject, but to the possibility of unlimited intellectual and moral growth… (Sheriff 1994 p. XVI)

It is a philosophy including science and religion focusing on *Chance, Love and Logic,* as Cohen (1923) calls his early selection of some of Peirce's philosophical essays. It has the form of a theory of evolution intertwined with a theory of signification, cognition, and communication that unites meaning and rationality through a theory of hope. Thus it is an abductive evolutionary process philosophy where *would-be*s or propensities are accepted as ontologically *reals* and where the natural laws are seen as evolving through cosmogony (Smolin 2013).

Logic – in Peirce's view – is semiotics and therefore includes meaning and feeling. To commit to the growth of knowledge through scientific work one must have faith in rationality and progress (Brier 2012, Sørensen et. al. 2012). Peirce proposed that the process of inquiry proceeds in the direction from anticipation or hope to the strengthening of belief through the phenomenon of habit-taking, as Ejsing (2007) shows very well. He starts the second section of his most famous philosophy of science work, "*How to make our ideas Clear*", like this:

> The principles set forth in the first of these papers lead, at once, to a method of reaching a clearness of thought of a far higher grade than the "distinctness" of the logicians. We have there found that the action of thought is excited by the irritation of doubt, and ceases when belief is attained; so that the production of belief is the sole function of thought. (Peirce 1878, Popular Science Monthly 12 (January 1878), 286-302)

Thus, Peirce values highly the development of the human mind's reasonableness. In 1903, Peirce gave a series of lectures on pragmaticism now known as *The Harvard Lectures on Pragmatism*, which are collected with a commentary by Turrisi (Peirce 1997). In these, Peirce explained further his view in an anti-psychological way, meaning that it is reason and not subjective experience that is the major driving force in knowing:

> "But how do we know that belief is nothing but the deliberate preparedness to act according to the formula believed? 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. … Why has evolution made man's mind to be so constructed? That is the question we must nowadays ask, and all attempts to ground the fundamentals of logic on psychology are seen to be essentially shallow.
>
> (Peirce: CP 5.28-29)

Peirce critically builds on the work of Aristotle, Duns Scotus, Kant, Hegel, and the Transcendentalists, integrating them into a new evolutionary process philosophy close to Whitehead's (1929)'s, but adding his triadic categories and semiotics as well as a fallibilist and unlimited view of the growth of knowledge. Peirce's triadic semiotics worked

on an original solution to the metaphysical problems connected to the relation between science, philosophy, mathematics and spirituality in the modern world. Peirce was truly a mathematical philosopher, believing that philosophy must begin with a semiotic logic resting in upon pure mathematics. But to him classical logic is only the formal aspect of triadic semiotics. As he writes:

> Therefore, 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)

To the usual logic of deduction and the questionable logic of induction, Peirce adds a logic of abduction. His theory of abduction rests on a philosophy of anticipation and includes a theory of the divine on an evolutionary basis, which he calls Agapism or evolutionary love.[25] This is done first through a critique of Kant's philosophy, which he greatly appreciated:

> "In my studies of Kant's great Critic …I was very much struck by the fact that, although, according to his own account of the matter, his whole philosophy rests upon his "functions of judgment," or logical divisions of propositions, and upon the relation of his "categories" to them, yet his examination of them is most hasty, superficial, trivial, and even trifling, while throughout his works, replete as they are with evidences of logical genius, there is manifest a most astounding ignorance of the traditional logic, even of the very Summulæ Logicales, the elementary schoolbook of the Plantagenet era. […] I was thus stimulated to independent inquiry into the logical support of the fundamental concepts called categories." (CP 1.560)

This leads to the insight that Peirce's categories of Firstness, Secondness and Thirdness – which he sometimes called the *cenopythagorean categories* – are produced as a constructive critical alternative to both Kant's and Hegel's categories. As he writes:

> "The cenopythagorean categories are doubtless another attempt to characterize what Hegel sought to characterize as his three stages of thought. They also correspond to the three categories of each of the four triads of Kant's table. But the fact that these different attempts were independent of one another (the resemblance of these Categories to Hegel's stages was not remarked for many years after the list had been under study, owing to my antipathy to Hegel) only goes to show that there really are three such elements." (CP 8.329)

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[25] Three modes of evolution have thus been brought before us: evolution by fortuitous variation, evolution by mechanical necessity, and evolution by creative love. We may term them …receive the names of tychism, anancism, and agapism.…tychasm and anancasm are degenerate forms of agapasm.... In genuine agapasm, on the other hand, advance takes place by virtue of a positive sympathy among the created springing from continuity of mind. This is the idea which tychasticism knows not how to manage. (CP 6.302-4)

This still stands out as an original renewal of a form of evolutionary theology after Hegel that is compatible with modern science (Brier 2009, Ejsing 2007). Brent (1998) interprets how this is consistent with Peirce's semiotic realism and spirituality 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, p. 212).

Like Hegel, Peirce is often characterized as an objective idealist and he uses the same term himself. If so it is a unique type. Peirce was well aware that his concept of irreversible time and thirdness set him apart from most idealists. He writes:

> . . . Obviously, then, the first move toward beating idealism at its own game is to remark that we apprehend our own ideas only as flowing in time, and since neither the future nor the past, however near they may be, is present, there is as much difficulty in conceiving our perception of what passes within us as in conceiving external perception. . . an immediate, intuitive consciousness of time clearly exists wherever time exists. But once grant immediate knowledge in time, and what becomes of the idealist theory that we immediately know only the present? For the present can contain no time. (CP 1.38)

So, if time is real, what are the necessary characteristics of the nature of the Cosmos (and man) in order to make the knowledge connection between the world and the human mind possible, there being no static order to mirror? That is the crucial philosophical question. Despite Tom Shorts denial of a consistent Peircean metaphysics, Peirce explains this wholeness and process philosophy several places in this writings. But the famous blackboard metaphor of what was before the material universe is considered one of the most important descriptions of how there came to be something instead of nothing:[26]

> … Let the clean blackboard be a sort of diagram of the original vague potentiality, or at any rate of some early stage of its determination. …This blackboard is a continuum of two dimensions, while that which it stands for is a continuum of some indefinite multitude of dimensions. …There are no points on this blackboard. There are no dimensions in that continuum. I draw a chalk line on the board. This discontinuity is one of those brute acts by which alone the original vagueness could have made a step towards definiteness. There is a certain element of continuity in this line. Where did this continuity come from? It is nothing but the original continuity of the blackboard which makes everything upon it continuous. What I have really drawn there is an oval line. …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. …. Now the clue, that I mentioned, consists in making our thought diagrammatic and mathematical, by treating generality from the point of view of geometrical continuity, and by experimenting upon the diagram.

[26] This is still a basic puzzle to foundational physics. But their explanations are getting closer and closer to Peirce's.

> We see the original generality like the ovum of the universe segmentated by this mark. … Continuity, as generality, is inherent in potentiality, which is essentially general. … Once the line will stay a little after it is marked, another line may be drawn beside it. Very soon our eye persuades us there is a new line, the envelope of those others. This rather prettily illustrates the logical process which we may suppose takes place in things, in which the generalizing tendency builds up new habits from chance occurrences. … At the same time all this, be it remembered, is not of the order of the existing universe, but is merely a Platonic world, of which we are, therefore, to conceive that there are many, both coordinated and subordinated to one another; until finally out of one of these Platonic worlds is differentiated the particular actual universe of existence in which we happen to be. (CP 6.210-13)

Thus, we see a development of this idea of the potentiality of all kinds of universes created from the original emptiness (Tohu va Bohu or pure zero, Brier 2014) and the continuity between what is potential and what becomes manifest. It is a bit like the probability wave in quantum physics. The manifest "particle" (a classical physical concept) in quantum physics is the result of the constraint of a vacuum field of many possibilities existing parallel in time. Only one manifests when the measurement apparatus is used. Peirce is very close to the same kind of reasoning when he writes about cosmology and of why there is something instead of nothing.

> There is, therefore, every reason in logic why this here universe should be replete with accidental characters, for each of which, in its particularity, there is no other reason than that it is one of the ways in which the original vague potentiality has happened to get differentiated.
>
> But, for all that, it will be found that if we suppose the laws of nature to have been formed under the influence of a universal tendency of things to take habits, there are certain characters that those laws will necessarily possess. …
>
> The subject of mathematical metaphysics, or Cosmology, is not so very difficult, provided it be properly expanded and displayed. It deeply concerns both physicist and psychist. (CP 6.213-15)

It is important that Peirce's focus on cosmogony contains humans and environment at the same time in a continuum. Thus, being and non-being are a continuum and so are the physical and psychological aspects of reality. But that calls for a cosmogonical explanation of the state before and outside the universe we know. This calls for metaphysical explorations of the necessary minimal requirements of a process reality that can make knowledge possible. Peirce goes on and explains his theory of pure zero as the germinal nothing:

> Metaphysics has to account for the whole universe of being. It has, therefore, to do something like supposing a state of things in which that universe did not exist, and consider how it could have arisen. However, this statement needs amendment. For time is itself an

> organized something, having its law or regularity; so that time itself is a part of that universe whose origin is to be considered. We have therefore to suppose a state of things before time was organized. Accordingly, when we speak of the universe as "arising" we do not mean that literally. We mean to speak of some kind of sequence, say an objective logical sequence; but we do not mean in speaking of the first stages of creation before time was organized, … 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. CP 6.216-19).

Peirce suggests a creation Ex Nihilo, but not with a non-absolute separation between the transcendental and the immanent. The pure Zero is neither matter nor mind, because it is the foundation of his cosmological view, which I will classify as *non-dualism*. This classification of Peirce's philosophy is beyond the received view of Peircean scholarship as it refers to Eastern philosophy, except Bishop (1981), who also points to this relevance. Nondualism or non-duality, have its origins among other things within the Buddhist tradition, with its teaching of the nonduality of the absolute and the relative, most famously in Nargajuna's (1995) teachings of the middle way. The other foundation of the term is with the Advaita Vedanta-tradition of Adi Shankara (Isayeva 1993), which states that there is no difference between Brahman and Atman, in nondual-consciousness.

This view is also foundational for panentheism. It is a 'neither-nor' approach to philosophical questions referring to a wholeness which exists here and now, prior to any apparent separation. Notice we are talking about philosophy and spirituality not of any religious social organization developed on these insights. Actually, we are talking about phenomena that are not foreign to modern physics, since one of the most curious concepts in quantum physics is that particles can spring out of nothingness, meaning that a region of empty space, which is containing no measurable energy, in theory, can bring into existence a pair of particles comprising a particle and its related antiparticle. Thus, quantum physics is not foreign to the idea that the essential unity of all is real, whereas duality and plurality are phenomenal illusion being only reflections of the One, which cannot be a sense object. As we have shown, Peirce knew these views, and the most likely source is the transcendentalists[27] and Paul Carus, the editor of The Monist.

[27] Peirce wrote about this: "I have begun by showing that tychism must give birth to an evolutionary cosmology, in which all the regularities of nature and of mind are regarded as products of growth, and to a Schelling-fashioned idealism which holds matter to be mere specialized and partially deadened mind. 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 Boehm, or from God knows what minds stricken with the monstrous mysticism of the East. But the atmosphere of Cambridge

An important argument for this characterization of Peirce's architectonical philosophy is that his philosophical framework is based on a continuity ontology or a Synechism, as he calls it, which clearly distinguishes his philosophy from Hegel's objective dialectic idealism. Peirce argues:

> In this proposition lies the prime difference between my objective logic and that of Hegel. He says, if there is any sense in philosophy at all, the whole universe and every feature of it, however minute, is rational, and was constrained to be as it is by the logic of events, so that there is no principle of action in the universe but reason. But I reply, this line of thought, though it begins rightly, is not exact. A logical slip is committed; and the conclusion reached is manifestly at variance with observation. It is true that the whole universe and every feature of it must be regarded as rational, that is as brought about by the logic of events. But it does not follow that it is constrained to be as it is by the logic of events; for the logic of evolution and of life need not be supposed to be of that wooden kind that absolutely constrains a given conclusion. The logic may be that of the inductive or hypothetic inference. … I say that nothing necessarily resulted from the Nothing of boundless freedom. That is, nothing according to deductive logic. But such is not the logic of freedom or possibility. The logic of freedom, or potentiality, is that it shall annul itself. For if it does not annul itself, it remains a completely idle and do-nothing potentiality; and a completely idle potentiality is annulled by its complete idleness. …Thus the zero of bare possibility, by evolutionary logic, leapt into the unit of some quality. … Now a quality is a consciousness. I do not say a waking consciousness – but still, something of the nature of consciousness. A sleeping consciousness, perhaps. (CP 6.219-21).

Thus, the cosmos is neither matter and nor mind but rather a kind of sleeping consciousness – or what David Bohm would call the implicate order – with an inborn rationality waiting to unfold and develop in the form of a semiotic process logic of relatives.

God as creational force in the development of semiotic rationality

Peirce's evolutionary theory must be seen as a process in which signs are integrated into a network of forces that further a growth of rational inference capacity in the development of cosmogony. First of all, Peirce's metaphysics is based on an ontological belief in the Universe as intelligible – solving Kant's problem of Das Ding and Sich – and an epistemology of the unhindered possibility of all scientific knowledge through a view of the ideality of the physical sciences, as his father wrote about (B. Peirce 1881). But that is not the same as modern physicalism. Here is then his son arguing for the necessary inherent symbolic nature of the nothing that the universe emerges from,

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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." (CP6.102)

in order for it to be intelligible to human beings:[28]

> A symbol is something which has the power of reproducing itself, and that essentially, since it is constituted a symbol only by the interpretation. This interpretation involves a power of the symbol to cause a real fact; … nothing can be more futile than to attempt to form a conception of the universe which shall overlook the power of representations to cause real facts. What is the purpose of trying to form a conception of the universe if it is not to render things intelligible? … If we are to explain the universe, we must assume that there was in the beginning a state of things in which there was nothing, no reaction and no quality, no matter, no consciousness, no space and no time, but just nothing at all. Not determinately nothing. For that which is determinately not A supposes the being of A in some mode. Utter indetermination. But a symbol alone is indeterminate. Therefore, Nothing, the indeterminate of the absolute beginning, is a symbol. That is the way in which the beginning of things can alone be understood. What logically follows? We are not to content ourselves with our instinctive sense of logicality. That is logical which comes from the essential nature of a symbol. Now it is of the essential nature of a symbol that it determines an interpretant, which is itself a symbol. A symbol, therefore, produces an endless series of interpretants. (EP: 322 (KAINA STOICHEIA))

Thus, there must not only be a tendency to take habits in the early universe. This tendency must also be of a symbolic nature, as this is one of the most indeterminate and vague signs, which also have a tendency to always grow and develop overall towards greater information content and rationality. Remember that Peirce thinks that the universe is developing towards "an absolutely perfect, rational, and symmetrical system, in which mind is at last crystallized in the infinitely distant future" (CP 1.33). Peirce argues further in KAINA STOICHEIA:

> … There can, it is true, be no positive information about what antedated the entire Universe of being; because, to begin with, there was nothing to have information about. But the universe is intelligible; and therefore it is possible to give a general account of it and its origin. This general account is a symbol; and from the nature of a symbol, it must begin with the formal assertion that there was an indeterminate nothing of the nature of a symbol. This would be false if it conveyed any information. But it is the correct and logical manner of beginning an account of the universe. As a symbol it produced its infinite series of interpretants, which in the beginning were absolutely vague like itself. But the direct interpretant of any symbol must in the first stage of it be merely the tabula rasa for an interpretant. Hence the immediate interpretant of this vague Nothing was not even determinately vague, but only vaguely hovering between determinacy and vagueness; and its immediate interpretant was vaguely hovering between vaguely hovering between

[28] We should be aware of the fact that Peirce defines three main kinds of symbol, namely terms, propositions and arguments. (CP 2340)

> vagueness and determinacy and determinate vagueness or determinacy, and so on, ad infinitum. But every endless series must logically have a limit.
>
> (EP: 323 (KAINA STOICHEIA))

This is Peirce's suggestion of how it is possible that we can know anything about the (external) universe and therefor how empirical science can be possible at all, since the empiricist explanation does not work, and he considers Kant's idea of things having qualities in themselves that we can have no access to (why postulate them in the first place?) to be meaningless.[29] The nature of reality has to be symbolic and for that to happen symbols must have an inherent tendency to grow towards more and more explicit interpretants (Houser 2014 explains more in his deep analysis of this quote).

Peirce thought of qualia as reals, but not actuals. For Peirce, only what exists in the form of seconds is actuals. Qualisigns like sour, blue, hot cannot be actuals in themselves; they have to be carried by other things with Secondness characteristics. There can thus be no empirical scientific investigation of qualisigns per se, only their manifestation as sign-tokens! The real signs are the type or dynamic form. The type is real but only exists through the tokens.

It seems that Pierce transfers much of the creational power to the symbolic aspect of reality. The thirdness of symbols creates the regularity through being a living general that is the foundation of being that lasts more than instances. This idea gets clearer if we carry on with the rest of KAINA STOICHEIA:

> …, let us note, first, that it is of the nature of a symbol to create a tabula rasa and therefore an endless series of tabulae rasae, since such creation is merely representation, the tabulae rasae being entirely indeterminate except to be representative. Herein is a real effect; but a symbol could not be without that power of producing a real effect. The symbol represents itself to be represented; and that representedness is real owing to its utter vagueness. For all that is represented must be thoroughly borne out.

[29] "It has been shown [3.417ff] that in the formal analysis of a proposition, after all that words can convey has been thrown into the predicate, there remains a subject that is indescribable and that can only be pointed at or otherwise indicated, unless a way of finding what is referred to, be prescribed. The Ding an sich, however, can neither be indicated nor found. Consequently, no proposition can refer to it, and nothing true or false can be predicated of it. Therefore, all references to it must be thrown out as meaningless surplusage." (CP 5.525)

> For reality is compulsive. But the compulsiveness is absolutely hic et nunc. It is for an instant and it is gone. Let it be no more and it is absolutely nothing. The reality only exists as an element of the regularity. And the regularity is the symbol. Reality, therefore, can only be regarded as the limit of the endless series of symbols.
>
> A symbol is essentially a purpose, that is to say, is a representation that seeks to make itself definite, or seeks to produce an interpretant more definite than itself. For its whole signification consists in its determining an interpretant; so that it is from its interpretant that it derives the actuality of its signification.
>
> … The vague always tends to become determinate, simply because its vagueness does not determine it to be vague (as the limit of an endless series). … It is of the nature of a sign to be an individual replica and to be in that replica a living general. … The very entelechy of being lies in being representable. A sign cannot even be false without being a sign and so far as it is a sign it must be true. A symbol is an embryonic reality endowed with power of growth into the very truth, the very entelechy of reality. This appears mystical and mysterious simply because we insist on remaining blind to what is plain, that there can be no reality which has not the life of a symbol. … A chaos of reactions utterly without any approach to law is absolutely nothing; and therefore pure nothing was such a chaos. Then pure indeterminacy having developed determinate possibilities, creation consisted in mediating between the lawless reactions and the general possibilities by the influx of a symbol. This symbol was the purpose of creation. Its object was the entelechy of being which is the ultimate representation. (EP 323-24)

This makes for an unusual conception of the divine force of creation in Peirce's philosophy including his philosophy of science. Ashley and Deely (2012) argues for this necessary dialogue and integration of science and theology in the creation of metaphysical frameworks in philosophy guiding our search for knowledge and meaning. For Peirce the divine is Firstness of Firstness or pure potential quality and it cannot, therefore, in its own nature, be investigated scientifically and/or formulated more precisely in words or signs. It is too vague. There can therefore be no self-evident dogmas about God except as a creational force.

The transdisciplinary goal of Peirce's philosophy is to know the world and our place in it as well as an explanation of how experience and knowledge is possible. It is his hope that the old war between empirical truth and existential belief can be exchanged for a mutual synergy on a non-dogmatic basis. Peirce accepts a kind of final causation, but under evolutionary temporal conditions in which "in the long process of creation God achieves his own being" (Peirce, MS 313). His teleology is not tied to any kind of necessitarianism, but is integrated into an evolutionary agapism, which opens for the ongoing possibility of new things and processes:

> The starting-point of the universe, God the Creator, is the Absolute First, the terminus of the universe, God completely revealed, is the Absolute Second; every state of the universe as a measurable point is the third. If you think the measurable is all there is, and deny it any definite tendency whence or whither, then you are considering the pair of points that makes

> the absolute to be imaginary and are an Epicurean. If you hold that there is a definite drift to the course of nature as a whole, but yet believe its absolute end is nothing but the Nirvana from which it set out, you make the two points of the absolute to be coincident, and are a pessimist. But if your creed is that the whole universe is approaching in the infinitely distant future a state having a general character different from that toward which we look back in the infinitely distant past, you make the absolute to consist in two distinct real points and are an evolutionist. (CP 1.362).

Thus, the development of the universe must be hyperbolic[30] or else it would return to the same state it started with and evolution based on irreversible time would not be real, as also Prigogine and Stengers (1984) argue. Peirce's point is that God is real (as Firstness), but does not exist as an entity that interacts with others. But what God is might be revealed at the end of man's systematic inquiry and the further development of the universe. If, through this process of inquiry, we converge towards a stability of meaning, we have reached the Peircean final interpretant.

In Peirce's philosophy, God as thirdness is agape or evolutionary love, which makes the universe grow evolutionarily by taking habits just like the symbols mentioned earlier. Therefore, an aspect of the tokens of God is the body of laws developing through evolution (Hartshorne and Rees 1953). The human pursuit of knowledge of these laws is science. It is the being of God as a very abstract being without material form that guarantees the existence of the object of the scientific enterprise and ensures realism instead of nominalism – or radical constructivism as we would call it today (DeMarco, 1972), where only humans are creators of reality. This view of Peirce's was without doubt inspired by his father's philosophy of the ideality of science (Peirce, B 1881).

Peirce's view of God or the divine is a panentheism (Raposa 1989, Hartshorne and Rees 1953),[31] which I have already described in Brier (2008a+b and 2010). Panentheism can be vied as pantheism combined with the idea of a transcendental reality beyond time and space – a pure zero as Peirce calls it – that cannot be spoken of but, still, is somehow the source of everything. It is a fundamental notion for Shankara's nondual Advaita Vedanta (Isayeva 1993, Hartshorne and Rees 1953).

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[30] "I may mention that my chief avocation in the last ten years has been to develop my cosmology. †2 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 chaos, tohu bohu, the nothingness of which consists in the total absence of regularity. The state of things in the infinite future is death, the nothingness of which consists in the complete triumph of law and absence of all spontaneity. Between these, we have on our side a state of things in which there is some absolute spontaneity counter to all law, and some degree of conformity to law, which is constantly on the increase owing to the growth of habit." (CP 8.317)

[31] Hartshorne and Reese (1953) discovers panentheistic themes already in Ikhnaton/Echnaton/Akhenaton (1375–1358 BCE), the Egyptian pharaoh that changed the Egyptian religion for a while into monotheistic worship of the Sun. He avoids both the separation of God from the world that will characterize traditional theism and the identification of God with the world that will characterize pantheism (Hartshorne 1953, 29–30). Early Vedantic thought implies panentheism in non-Advaita forms that understand non-dualism as inclusive of differences, as well as in Lao-Tse's *Tao te King* (4th c. BC) and in some of the Judeo-Christian scriptures (1953, 32–38). Peirce must have heard about Advaita Vedanta from Swami Vivekananda, who was giving lectures in Sara Bull's salon and Cambridge Conferences, of which Peirce gave a series in 1989 (Ketner 1992:18).

In Peirce's view, science is the only road to common knowledge about the world as Secondness and Thirdness, and personal religiosity is a matter of the vague experience of the Firstness of pure feeling in free musing (CP 6.452). In Peirce's semiotics, meaning arises out of the form of objects determining interpretants in semiosis. Scientific knowledge occurs when a stable meaning is reached among many researchers. If that stable meaning is the same as the final interpretant, we can say it is 'true'. Peirce writes that:

> 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. (Peirce CP 1.211)

As we have already started to explore, then an important way to understand Peirce is his synechism. According to this unbroken field view, there has to be some deep invisible connection between matter and mind. Like Whitehead (1929), he suggests a *process view*. Peirce integrates chance as a foundational element in *tychism* and considers it a fundamental element of his metaphysics, viewing the basis of reality as a spontaneously generating field or force of possible existence of quale-consciousness. It is a level of pure potentialities, like the modern theoretical idea of the quantum vacuum field that is never at rest. That is, a concept and theory that was not yet invented in Peirce's life time, but is still under interpretation in physics (Haisch, B., Rueda, A. and, Dobyns, Y. (2001).

If we return to what this cosmogony means for our view of knowledge and Wissenschaft, then Peirce makes *a full naturalization of all possible knowing in the universe,* be it subjective or intersubjective phenomena. A view consistent with his phenomenological basis in phaneroscopy, which also has the consequence that the external world is intimately linked with an "inner world", which is crucial to be able to establish a theory of transdisciplinarity, encompassing the qualitative as well as the quantitative "sciences" into Wissenschaft.

The force of evolution in Peirce's metaphysics is called *evolutionary love* and a famous paper was named after it (Peirce, 1893). It was a love that was to a certain degree blind, like Schopenhauer's *Will*, [32] as Peirce did not believe that God or the divine was conscious in itself, because that is the privilege of a living body with a peripheral and a central nervous system connected to organs to be able to sense qualia and thus have quale-consciousness. Peirce's idea is that evolution should be seen as part of the development of the processes of reasoning. Hans Moravec (1988) writes in a similar vein:

> "Encoded in the large, highly evolved sensory and motor portions of the human brain is a billion years of experience about the nature of the world and how to survive in it. The deliberate process we call reasoning is, I believe, the thinnest veneer of human thought, effective only because it is supported by this much older and much more powerful, though usually unconscious, sensorimotor knowledge." (Moravec 1988:15-16).

As opposed to Schopenhauer's Will that seeks only its own, Peirce's evolutionary love is not egoistic or deterministic, but manifests as an innovative process of reasoning based on an element of chance. So Peirce does

[32] Arthur Schopenhauer (1788-1860) was a German philosopher known for his work *Die Welt als Wille und Vorstellung* from 1818. I rely on the Danish translation from 2005, *Verden som vilje og forestilling* (1819-1844), which includes later revisions.

not fall into the trap of historicism (Popper 2002/1957). But his question to evolutionary research from biosemiotics to cultural history and linguistics is how does evolution manage to adapt to logic and semiotic structure, be they in the brain, language or cultural patterns (Stjernfelt 2014)?

The Great Emptiness

If we view the Universe as a system, then it follows that it is the largest system of all, and all other systems are *subsystems.* But it makes us ask, what is the environment of the universe*?* And what is before and outside of this space-time system? And is it not from that being that the whole manifest universe emerges? As an answer to this sort of question Peirce suggests – as we have already demonstrated – that the universe is the immanent part of the divine viewed as a fecund transcendental emptiness (*tohu bohu*) "behind and before" the manifest world. Pierce writes:

> In that state of absolute nility, in or out of time, that is, before or after the evolution of time, there must then have been a tohu bohu of which nothing whatever affirmative or negative was true universally. (CP 6.490)

Tohu wa bohu describes the condition of the earth before God said, "Let there be light" (Gen. 1:3) and created the visible world. It is a Biblical Hebrew term found in the Book of Genesis 1:2 and is usually translated as "waste and void," "formless and empty," or "chaos and desolation." It is the chaos and void before God created the World. One way to interpret this is that the transcendental part of the divine is not conscious, but obtains consciousness through creating the concrete manifest world in time, space and energy (Secondness) as well as laws and signification (Thirdness). That is implicit in Peirce's formulation that God is real as a general, but does not exist as an actual. Signs, on the other hand – like symbols – are real and exist through their tokens. Thus, in a way, the world is a sign token of God, his big argument.

The real in Peirce's transdisciplinary pragmaticist paradigm is not only external things! The existent, or Secondness, is that, which reacts against other things and forces. The external world then does not consist merely of existent objects and their reactions because *among the reals Peirce also counts words, signs, general types and would-bes.* (CP 8.191). Thus Peirce does not believe that the external world is completely independent of our semiosis. The universe never completely escapes its sign nature aspect and becomes a completely independent "thing" as is implicitly assumed in much natural science.

In Peirce's scholastic realism, the thirdness of reals is vagues, would-bes or possibilities (CP 5.453). Thus we must believe that there are real tendencies and possibilities in the world (Thirdness) (Haack, 1992). This is later exemplified in quantum physics, with its concept of virtual particles and probability waves that only have tendencies to exist in definite forms. Thus, virtual particles only come into existence for a limited time, but they are predicted by the equations describing the laws of quantum physics and confirmed by experimental results. The singular particle is a token of the reals of its vacuum field, such as the electron, which is a manifestation of the electron field. Also quantum mechanics points to the deep connection between observer and observed in the measurement process.

This tychastic, synechistic agapism makes for an unusual conception of God in Peirce's philosophy.

Peirce regarded God as *the* necessary being in his famous religious paper from 1908 entitled "A Neglected Argument for the Reality of God." (CP 6.452ff). In it he insisted that:

"The endless variety in the world has not been created by law. It is not of the nature of uniformity to originate variation, nor of law to beget circumstance. When we gaze upon the multifariousness of nature we are looking straight into the face of a living spontaneity." (CP 6.553).

The aim of logical analysis in Peirce's philosophy is then to understand the true character of the object in question, not to pass moral judgment. Love is thus in Peirce's conception related to the recognition and understanding of the law. Thus, the importance of love and therefore his dynamic process view of the divine in agapism is to fuel the evolutionary growth of reasoning and the concept is therefore essential for Peirce's theory of science! This is underlined by his emphasis on feeling and emotion as central to all "rational" thought, also in the form of an evolution-based *sentimentalism*. He writes:

> Reasoning is of three kinds. The first is necessary, but it only professes to give us information concerning the matter of our own hypotheses and distinctly declares that... The second depends upon probabilities. The only cases in which it pretends to be of value is where we have, like an insurance company, an endless multitude of insignificant risks. …The third kind of reasoning tries what il lume naturale, which lit the footsteps of Galileo, can do. It is really an appeal to instinct. Thus reason, for all the frills it customarily wears, in vital crises, comes down upon its marrow-bones to beg the succour of instinct. Reason, then, appeals to sentiment in the last resort. Sentiment on its side feels itself to be the man. That is my simple apology for philosophical sentimentalism.
>
> Sentimentalism implies conservatism; and it is of the essence of conservatism to refuse to push any practical principle to its extreme limits – including the principle of conservatism itself. We do not say that sentiment is never to be influenced by reason, nor that under no circumstances would we advocate radical reforms. … I would not allow to sentiment or instinct any weight whatsoever in theoretical matters, not the slightest. Right sentiment does not demand any such weight; and right reason would emphatically repudiate the claim if it were made. True, we are driven oftentimes in science to try the suggestions of instinct; but we only try them, we compare them with experience, we hold ourselves ready to throw them overboard at a moment's notice from experience. If I allow the supremacy of sentiment in human affairs, I do so at the dictation of reason itself; and equally at the dictation of sentiment, in theoretical matters I refuse to allow sentiment any weight whatever. (CP 1.630-1.634)

Thus, Peirce argues for a complementary function of sentiment and logic in his architectonic philosophy. Peirce shows that an ontology of the world as a closed and dead mechanism deterministically run by universal laws is inadequate as a framework for a theory of meaningful knowledge and empirical quantitative research. Thus, in Peirce's understanding creation is not deterministic but open-ended. Furthermore, for Peirce, man's self is a developing symbol in the huge argument of the universe he tries to comprehend.

The sciences can then be considered as systems of rationalized expectations in social commitment. These

rationalized expectations are carried by collectives and their scholarly discourses, which is a special kind of communication systems that leads to a collective, impersonal, still fallible knowledge. Logic to Peirce is thus the intersubjective product of a social, ethical striving for common rationality and the Summum Bonum, which is how he ideally viewed science. Peirce-scholars understand aesthetics to be the science of the Summum Bonum (the greatest good), and they identify the greatest good as the growth of concrete reasonableness (Potters 1997).

As a consequence of this view, both science and religion are fallible, and cooperation between science and religion is therefore seen as highly necessary in the pursuit of knowledge and meaning (See also Ashley and Deely 2012). As such, Peirce delivers a possible cultural paradigm for discursive enlightenment in a global spiritual culture by way of his pragmaticist semiotic philosophy.

There have been many discussions about to what extend Peirce, in the fourth period of his pragmatist, triadic, semiotic philosophy, managed to develop a full philosophy. The final product in my view transcends the usual boundaries between philosophy, religion and science or rather spirituality in modernity after Kant and Hegel, though still being inspired by both. Peirce's mature semiotic philosophy is especially focusing on the connection between faith, love, knowledge, truth, signification and ethics as a means to obtain the Summum Bonum. This is pretty close to the Neoplatonist, Plotinus' view. However, Kelly Parker – who has written about this similarity (Parker 1998) – shows clearly, where they part in a way that makes Peirce's philosophy more compatible with modern philosophy of science:

> As law takes hold, the evolving cosmos can be seen wending its way toward a Universe of Necessity, in which law would be perfect. This Universe is the completely reasonable state of things that is identified (in Peirce's aesthetics) as an ideal. This universe is on the one hand unrealizable in principle, since it would imply the complete eclipse of Possibility and Haecceity, which are as fundamental as Necessity; on the other hand, it is the regulative ideal toward which self-controlled thought and action aim. The increase of reasonable thought and action, in the context of all three universes, is accordingly the summum bonum in Peirce's philosophy. … it is notable that Peirce, like Plotinus, sees the origin of the universe as the result of a spontaneous (i.e. uncaused) act of creation. This act of creation proceeds through stages, and both philosophers see the realm of existent bodies as an imperfect reflection of the realm of Forms that is the proper object of knowledge. Though the pregnant Nothing of the zero-state bears some affinities to the Plotinian One, there is apparently no room in Plotinus for Peirce's doctrine of tychism, his insistence on irrational chance as the driving force behind creation. The Plotinian One is the ground of creativity and necessity. Peirce separates these two principles. Creativity is Firstness, the generative principle, while necessity is Thirdness, the end toward which events in the universe are drawn. Given the role of indeterminacy in modern scientific explanations, it may be that Peirce's approach is to be preferred.
>
> (Parker http://agora.phi.gvsu.edu/kap/Neoplatonism/csp-plot.html)

Peirce's unique metaphysic is a Panentheistic sort of Agapistic knowledge evolution where science is the only road to rationally arguable knowledge about the world as Thirdness, and the divine and personal religiosity is a matter of the Firstness of pure feeling. The religious as phenomenon is about intuitive pure feeling. This has

nothing to do with the social form the various religions have taken and the way power is veiled in these. But this feeling is a general spirituality that is behind science and a supplement to it.

Peirce's view of how religion and science is deeply connected differs from what any other philosopher has suggested, except Whitehead's process philosophy, but there are also important differences here, like Peirce's Panentheism (Raposa1989, Clayton and Peacock 2004), his almost Neo-Platonist view of creation (Kelly Parker 2002) and his Buddhist and Vedantic metaphysics of emptiness or Tohu wa Bohu combined with a view of creation as an ongoing undeterminable process. The idea of emptiness is also foundational to Nargajuna's Buddhism of the middle way (Nargajuna 1995). This was probably what encouraged Peirce to see Buddhism and Christianity in their purest mystical forms integrated into an agapistic Buddhisto-Christian process view of God. This idea of Buddhisto-Christianity was taken up by Charles Hartshorne (1983) – one of the most important philosophers of religion and metaphysicians of the twentieth century – who also wrote about Whitehead's process view of the sacred (Hartshorne1972).

There is no doubt that Peirce's evolutionary process view combined with his fallibilism adds something to both Buddhism and Christianity, as also Hartshorne sees it in his development of a process theology (Hartshorne and Rees 1953:258-269. The problem with this understanding for most Christians is that it would demand a change in their concept of God. Peirce's God is real but does not exists and therefore is not conscious and cannot have a conscious will based on a personhood, as it is understood by most Theists. God cannot be all-knowing either, as true creation and evolution make new unpredictable things emerge, and the essence of divinity is continuous creativity, although it is based on an absolute platform of emptiness and potentiality in order to create actuality (Hartshorne and Reese 1953:514, Hartshorne 1962). Therefore the whole foundation of the creationist concept of a conscious plan in the creation of the world collapses in Peirce's synechist and thycistic semiotic agapism. As in evolutionary epistemology, there is a deep connection between the process of human cognition, ecology and evolution in the form of semiosis' combination of chance, love and logical reasonableness.

John Archibald Wheeler's (1990) "it from bit participatory universe" is the closest a modern philosophical physicist has come to Peirce's vision. But as most physicists, Wheeler is basing his view on an objective information-theoretical view and fails to establish the reflective phenomenological basis, that is so foundational to Peirce's pragmaticist semiotics and view of the "natural light of reasoning". According to Peirce God is in the world (immanent) as Agapistic evolution towards the Summum Bonum, in which the universe becomes more and more orderly, loving and rational. Order and love seems to support each other in his evolutionary semiotics, where the "pure feeling" through "the law of mind" in the process of the divine is becoming conscious, and we – as selves – are the imperfect fallible dialogical symbols in the "big argument" that the world is developing into. Peirce's view is interactionist like Wheeler's, in that we can support the development of orderly reasoning capacity in cosmogony by becoming more truth-loving, rational, self-controlled symbols in the development of our world. This is also a Unitarian-inspired idea.

It is also interesting that Peirce's view is close to a combination of modern quantum field physics, thermodynamics and system theory, including self-organization theory. However, in contrast to these paradigms, his view is integrated with phenomenology, ethics and aesthetics in a theory of science, so far unmatched in system and cybernetic information philosophy (with notable exceptions like objective idealists like Erwin Làszló (2004), who is standing out in meticulously working towards an integrated view of modern physics with a pure

objective idealism and system thinking through a concept of information, as in his book *Science and the Akashic Field: An Integral Theory of Everything*).

But my critique of the cybernetic and general system-theoretical approach of architectonic and cosmogonical philosophies is still that there seems to be no logical way from an objective concept of information to a triadic pragmaticist semiotics, which has the ethics, aesthetics and phenomenological philosophical basis that makes it compatible with human conscious and linguistic thinking processes (Brier2008a). Only Peirce's three phenomenological and pure, mathematically based categories in combination with his tychism, synechism, agapism and pragmaticism, combined into a semiotics, can do this job.

The possibility of a modern evolutionary architectonic metaphysics of science including a metaphysics of the divine

Peirce sums up his view on logic, reasoning capacity in the universe and the integration with the divine "Chance, love and logic" in the following way: "To believe in a god at all, is not that to believe that man's reason is allied to the originating principle of the universe?" (CP 2.23-24). Inspired by Buddhism and transcendental Christianity, Peirce suggests that the universe is the immanent part of the divine and that the other "part" is a transcendental emptiness (Tohu wa Bohu) "behind and before" the manifest world. The transcendental part of the divine is not conscious, but obtains consciousness through creating the manifest world in time, space and energy (Secondness) as well as laws and signification (Thirdness). But in Peirce's metaphysics the tool of creation is an ever ongoing evolution.

However, since his realistic ontology is hylozoist or hylopathic – like Aristotle's – and not an atomistic materialism, then one type of evolution, such as the Darwinian, does not have explanatory power enough. With a metaphor, they are organs in the physiology of reasoning, rather than building blocks in the construction of reasoning. Thus, he does not see logic as a part of language. Rather language is one special way of processing logic and semiotics. Logic and semiotics can (and should) be studied generically separated from the way they are realized in *any particular* physical medium (such as a human brain), so that we do not confuse qualities of the medium with qualities of the process. Psychology, as the study of how cognition works in specific types of organisms (such as humans), simply is not general enough to reveal what is basic about semiosis.

Though modern materialism now rests on more fundamental concepts of quantum matter fields and energy as the basis of the various forms of particles and forces, compared to Newton and Laplace's classical atomic mechanics, the modern scientific worldview still have very deep problems in constructing an ontology that can explain the emergence of intentionality, awareness, feelings, symbolic thinking, rationality and language-borne self-consciousness. Peirce writes about his vision of religion, rationality and man's connection to the evolving universe:

> . . .The opinion just now referred to, that logical principles are known by an inward light of reason, called the "light of nature" to distinguish it from the "light of grace" which comes by revelation, has been the opinion entertained by the majority of careful logicians.
>
> The phrase "light of reason," or its near equivalent, may probably be found in every literature. The "old philosopher" of China, Lao-Tze, who lived in the sixth century B.C.

> says for example, “Whoso useth reason's light, and turneth back, and goeth home to its enlightenment, surrendereth not his person to perdition. This is called practising the eternal.” The doctrine of a light of reason seems to be inwrapped in the old Babylonian philosophy of the first chapter of Genesis, where the Godhead says, “Let us make man in our image, after our likeness.” It may, no doubt, justly be said that this is only an explanation to account for the resemblances of the images of the gods to men, a difficulty which the Second Commandment meets in another way. But does not this remark simply carry the doctrine back to the days when the gods were first made in man’s image? To believe in a god at all, is not that to believe that man’s reason is allied to the originating principle of the universe?
>
> The reasonings of the present treatise will, I expect, make it appear that the history of science, as well as other facts, prove that there is a natural light of reason; that is, that man’s guesses at the course of nature are more often correct than could be otherwise accounted for, while the same facts equally prove that this light is extremely uncertain and deceptive, and consequently unfit to strengthen the principles of logic in any sensible degree. (CP 2.23-24)

As a consequence of this view, both science and religion are fallible. Science – broadly speaking – is the road to create more knowledge about the divine and truth; to make our faith stronger. In this way both religious and scientific fundamentalism are avoided and a transdisciplinary framework for knowledge is created. The religious view is not an end to knowledge, because there is no such thing in this metaphysics based on emptiness. Peirce’s theory is not only transdisciplinary but also transcultural as Nicolescu’s (2002 and 2014). Peirce delivers a unique cultural paradigm for a trans-scientific enlightenment in a global culture by his pragmaticist triadic semiotic philosophy through creating a philosophical framework where a mutual enrichment between science and spirituality will be possible in the future.

Acknowledgements

A thank to Anna Cabak Rédei, Gary Richards and Gary Fuhrman for productive comments on an earlier draft of the chapter, to Charles Tandy for the invitation and to Nathan Hauser for some good advice on the sources of Peirce’s worldview.

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